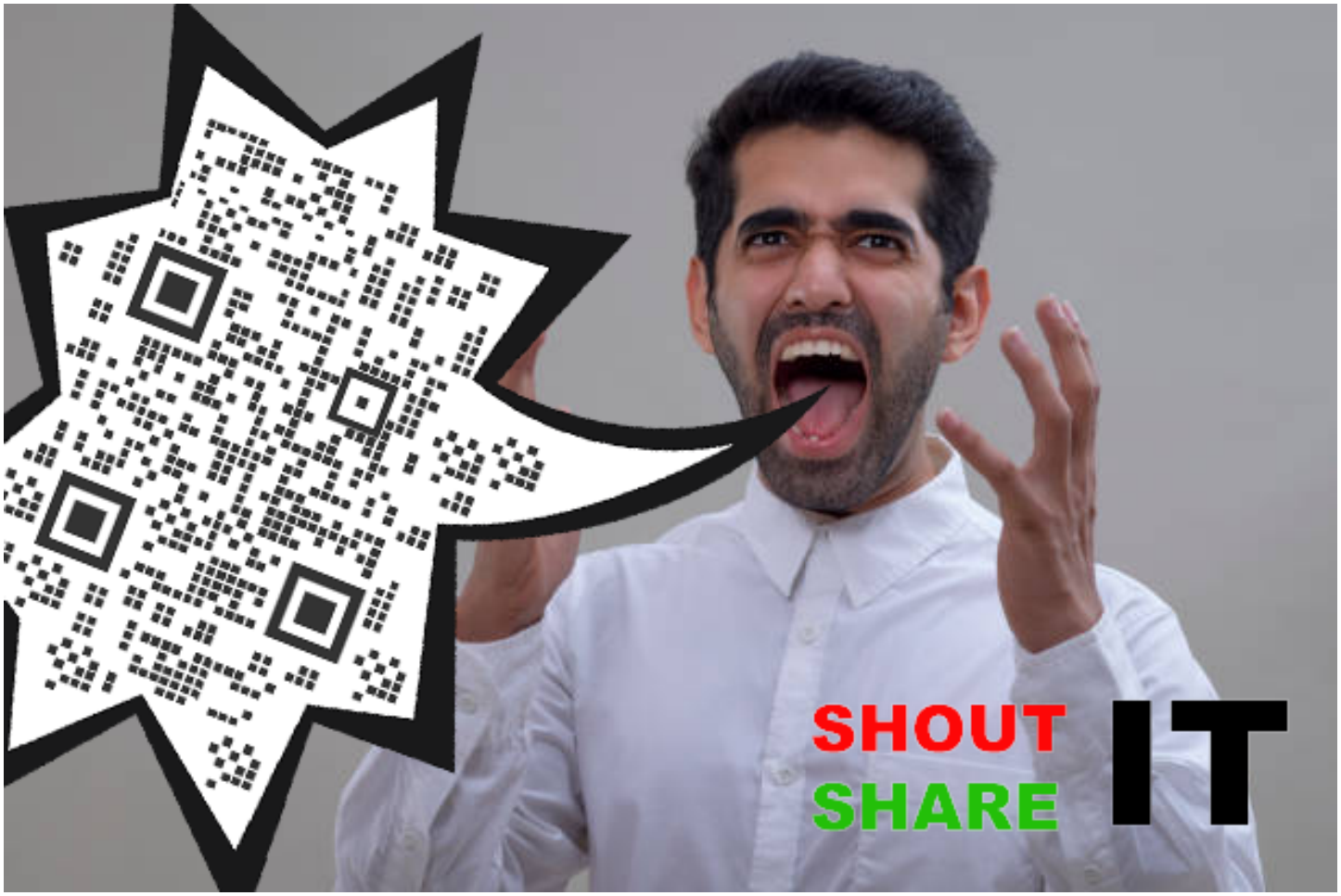
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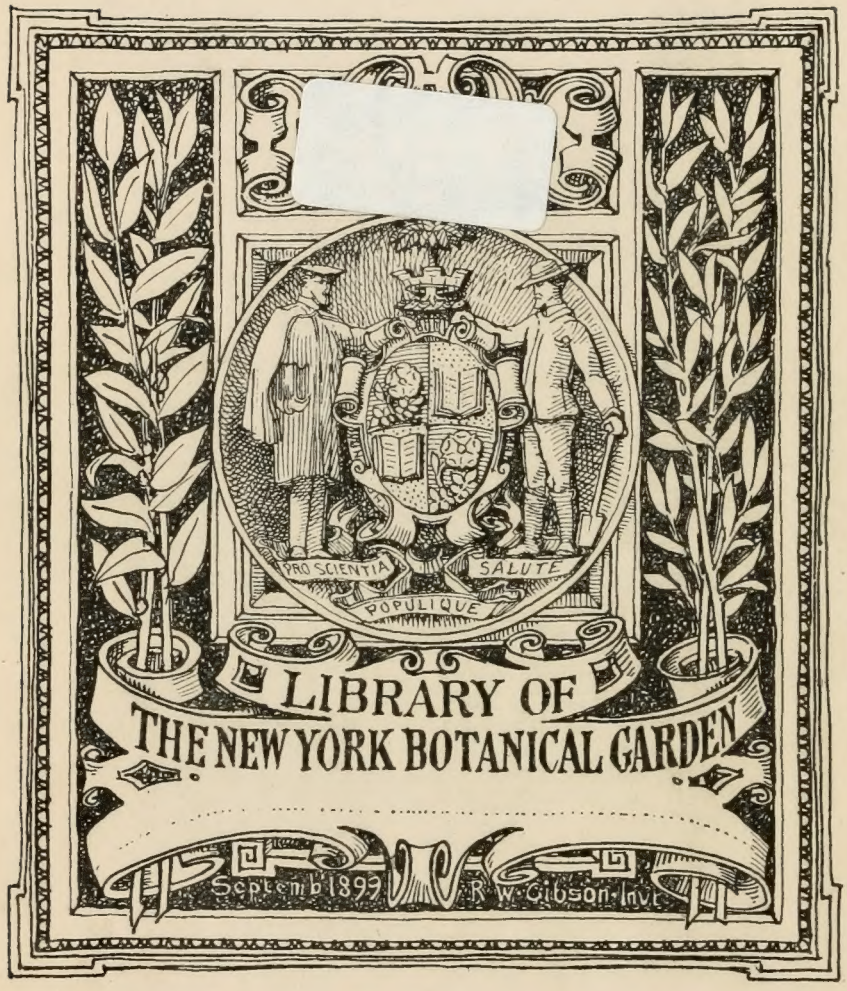
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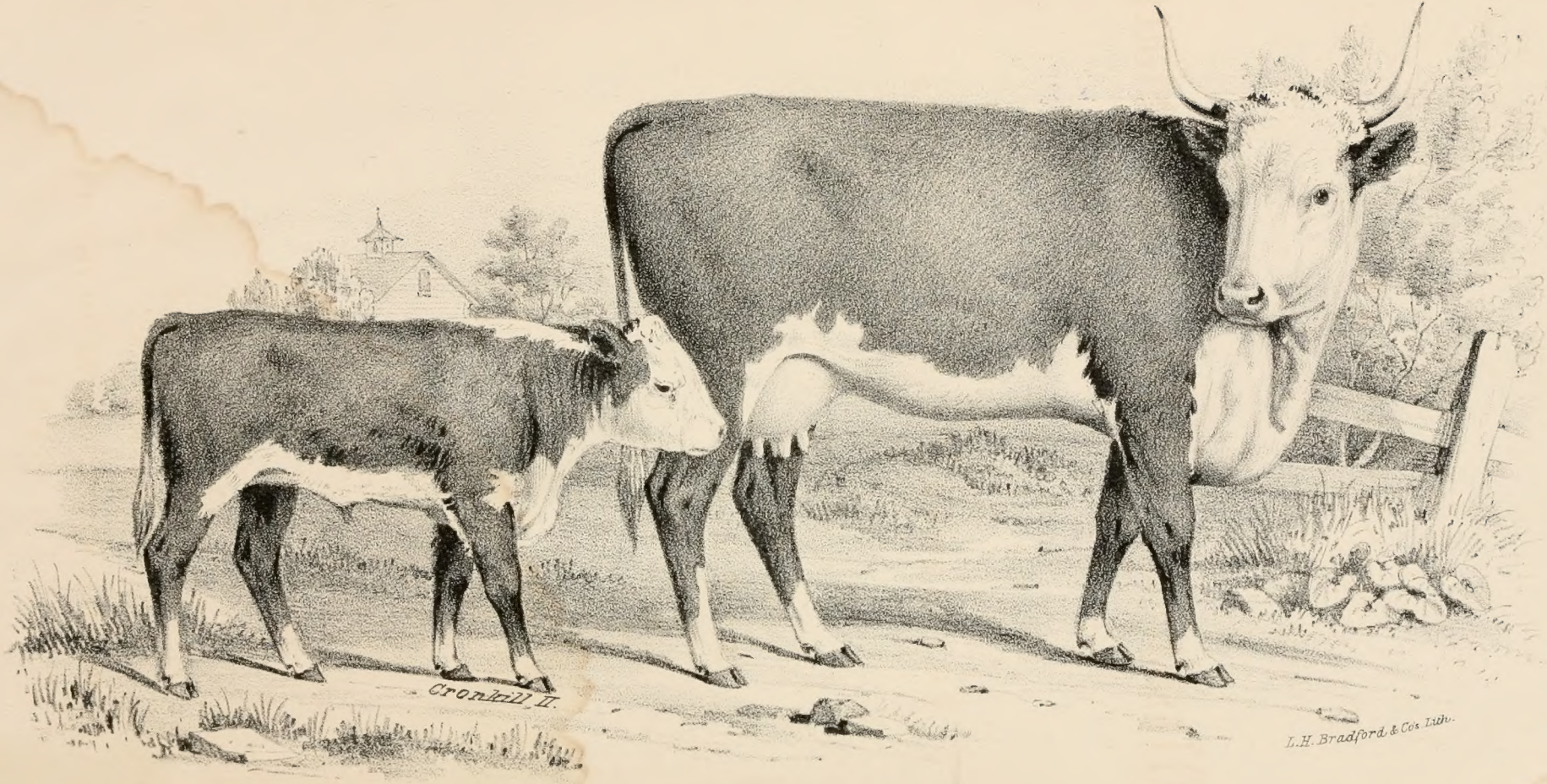

MILTON.

First Prize Hereford. Owned by the State.

See p. 27 of Pt. 1st or Preface of Pt. 2nd.

THIRD ANNUAL REPORT

OF THE

SECRETARY

OF THE

Massachusetts Board of Agriculture,

LIBRARY
NEW YORK
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GARDEN

TOGETHER WITH

THE REPORTS OF COMMITTEES

APPOINTED TO VISIT THE COUNTY SOCIETIES.

WITH AN APPENDIX,

CONTAINING AN ABSTRACT OF THE

FINANCES OF THE COUNTY SOCIETIES.

1855

BOSTON:
WILLIAM WHITE, PRINTER TO THE STATE.
1856.

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1855

BOARD OF AGRICULTURE.

1856.

EX OFFICIIS.

His Excellency HENRY J. GARDNER.
His Honor HENRY W. BENCHLEY.
FRANCIS DeWITT, *Secretary of State.*

APPOINTED BY THE GOVERNOR AND COUNCIL.

EDWARD HITCHCOCK, *of Amherst.*
MARSHALL P. WILDER, *of Dorchester.*
BEN: PERLEY POORE, *of West Newbury.*

CHOSEN BY THE SOCIETIES.

Massachusetts,	ROBERT C. WINTHROP, *of Boston.*
Essex,	MOSES NEWELL, *of West Newbury.*
Middlesex,	SAMUEL CHANDLER, *of Lexington.*
Middlesex, South,	WILLIAM G LEWIS, *of Framingham.*
Middlesex, North,	JOHN C. BARTLETT, *of Chelmsford.*
Worcester,	JOHN BROOKS, *of Princeton.*
Worcester, West,	WILLIAM PARKHURST, *of Petersham.*
Worcester, North,	IVERS PHILLIPS, *of Fitchburg.*
Worcester, South,	OLIVER C. FELTON, *of Brookfield.*
Hampshire, Franklin and Hampden,	GEORGE W. HUBBARD, *of Hatfield.*
Hampshire,	LUKE SWEETSER, *of Amherst.*
Hampden,	FRANCIS BREWER, *of Springfield.*
Franklin,	THOMAS J. FIELD, *of Northfield.*
Berkshire,	JUSTUS TOWER, *of Lanesborough.*
Housatonic,	JOHN WILKINSON, *of Gt. Barrington.*
Norfolk,	BENJAMIN V. FRENCH, *of Braintree.*
Bristol,	J. H. W. PAGE, *of Boston.*
Plymouth,	SETH SPRAGUE, *of Duxbury.*
Barnstable,	GEORGE MARSTON, *of Barnstable.*

CHARLES L. FLINT, *Secretary.*

THIRD ANNUAL REPORT

OF THE

SECRETARY

OF THE

BOARD OF AGRICULTURE.

To the Senate and House of Representatives of the Commonwealth of Massachusetts :—

The circumstances under which the State Farm at Westborough came into the charge of the Board of Agriculture, having been detailed in my last Annual Report, it now becomes my duty to present a statement of its management during the past year.

As some inquiries have been made, however, as to the objects of the transfer and the designs of the Board in assuming the control of the farm, it may be well to give in this place, a brief summary of the causes which led to the change, and the manner in which it was effected.

The farm in question was connected with the State Reform School, for the purpose of supplying milk and other necessary products, and affording healthy and useful employment to the boys. It contains about two hundred and eighty-five acres, beautifully located, and embracing a variety of soils. By the Act establishing that institution this farm was placed under the charge of the Trustees. As the number of inmates of the school rapidly increased it was found that the faithful superintendence and management of the institution demanded much

time and care, and that the farm not unfrequently interfered with the performance of duties more immediately connected with the school.

In the meantime, the Board of Agriculture, a body so constituted as to represent fairly every class of agricultural knowledge in the State, were desirous of doing something by way of experiment, to advance the cause of practical agriculture. Finding the Trustees also desirous of being relieved of the care and responsibility of the farm under their charge, they resolved, after careful consideration, to petition the Legislature, in conjunction with the Trustees, for an Act authorizing the transfer of the farm into their hands. The committee of the Legislature to whom this petition was referred, made a report in which they stated that "The Board of Agriculture would be gratified to secure land upon which various modes of cultivation may be thoroughly tried and a series of experiments instituted to test the value of the various concentrated and other manures, which are so constantly urged upon the attention of farmers. Your committee are of opinion that the interest and the wishes of farmers as a body, require that such experiments should be made and reliable results ascertained. The farm at Westborough is admirably adapted for the purpose.

"The Trustees of the State Reform School and the State Board of Agriculture are both children and agents of the State; both Boards were instituted and both labor for the same end, the good of the State. The only question is, which Board can most conveniently and profitably have charge of a particular portion of State property. Heretofore, the farm has been improved and cultivated at the expense of the State, and the State has furnished consumers of all its products, with the exception of small quantities of fruit, &c., which have been sent to market. A much larger amount of agricultural products will be required for the establishment, and it is believed that, under the best management, a much larger amount may be produced without proportionate increase of expense. Further permanent improvements are required, and ought to be made, under either Board. As the State consumes all the products of the farm, no money can be realized from their sale, and consequently the State must furnish funds to make necessary improvements and pay current expenses. The members of the

two Boards are unanimous in their views, and an arrangement is contemplated by which the Trustees of the Reform School will, at a stipulated price, furnish boys to work upon the farm, and to a much greater extent than it has been heretofore found expedient or profitable to employ them in agricultural labor; and the Board of Agriculture will supply the institution with milk, vegetables, and other needed products of the farm, do the cartage of coal, &c. Thus the labor of the boys and the products of the farm will be applied for the benefit of the State substantially, as heretofore, only under different directions. The bulk of the farm will undoubtedly continue to be carried on under the usual improved modes of cultivation, while a small portion will be devoted to experiments of which we have spoken."

The result was, that an Act was passed by the Legislature of 1854, authorizing the transfer, in accordance with the petition. A contract was duly made expressing the wishes and intentions both of the Trustees and the Board of Agriculture, and in accordance with the law, and since the first of April, 1854, the farm has been under the charge of the Board of Agriculture.

It will be obvious, on a moment's reflection, that the farm is a necessary adjunct to the Reform School; on account of the paramount importance of the school itself, the farm must be cultivated and carried on in the manner most useful and beneficial to that institution—its own interests being of secondary importance. In all the operations of the Board therefore, in all crops cultivated and all labor employed on the farm, regard must first be had to the wants of the school.

Under such circumstances it would evidently be impossible to make what is technically called a "model farm," or, indeed, an experimental farm, in any proper sense of that term. The true course must be simply to cultivate the larger part of the land in a plain, practical, farmer-like manner, after the most approved methods now known, and to subject only a small part of it to experiments, such as have been suggested above. This plan has been adopted, and it has thus far been carried out, as it is believed, to the satisfaction both of the Trustees and of the Board.

With reference to the experiments to be instituted, it was not, and ought not to be expected that the anticipated results would

be obtained in one year or two; but rather that by a series of experiments, skilfully and carefully conducted through a series of years, facts would be arrived at which would be of permanent value, so far as they might extend, to the science of agriculture. Nor could the expenses of the farm proper be kept within the limits of ordinary farm expenses. In order to carry out the benevolent objects of the institution a large number of boys must be employed and be taught, so far as practicable, all the details of farm labor. To do this properly, required a much greater number of men than would have been necessary under other circumstances; and these men must be of a better class, and receive higher wages than in ordinary cases. During the past summer, for instance, no less than thirteen men have been needed, and during a large part of the time, one hundred and fifty boys from the school have daily been furnished with work. The average number of boys per day for the season has been eighty-four.

Moreover, the farm, when it came into the hands of the Board, was not in a condition to do credit to the institution or to the State. Many permanent improvements were needed, involving a very considerable outlay. These improvements were equally necessary, whether the farm was to be managed by the Board or by the Trustees, and must have been made in any event. Out of the amount appropriated last winter for the expenses of the farm no less than $3,349.10 have been spent on permanent improvements, such as clearing land of stone, trenching, building reservoir, &c., the details of which will be found in the report of the Committee on Improvements and in the Appendix, to which reference is respectfully made.

But the expenses of the farm under its present management are no greater than they would be under the former, or any other arrangement. It always has been, is, and must hereafter be, managed at the expense of the State. The State furnishes the labor, to some extent, from the inmates of the school; but the inmates of the school consume the products as intimated above. The members of the Board are not paid for their services nor for the time they devote to the superintendence of the farm—to the sacrifice, often, of their personal interests—only their necessary incidental expenses being allowed. The Board, moreover, constituted as it is, in a great measure, of

delegates chosen by the county agricultural societies, forms a pretty complete representation of the intelligent farmers in all parts of the Commonwealth. The committees appointed for the more immediate supervision of the farm have the benefit of the suggestions of the whole Board, whose duty it is to give their personal attention from time to time to the inspection of the crops, and an examination into the general system of management.

Accurate accounts are kept between the institution and the Board; the former being charged with all the products of the farm, labor, teaming, &c., and credited with the labor of the boys, in order to show the expenses or profits of each department; though it is obvious that so far as the actual expense to the State is concerned, it can make no difference on which side the balance stands, as the loss must, in the end, be borne by the State; both Boards being, as it were, children of the State. In fact, the arrangement is beneficial to the State in a financial point of view, since each department forms, to some extent, a check on the other, and each strives, so far as the two come in comparison with each other, to make its expenses as low as is consistent with true economy.

At a meeting of the Board held at the farm at Westborough, on the 4th April, 1855, at which were present His Excellency Gov. Gardner, His Honor Simon Brown, and Messrs. Brewer, Chandler, Clapp, French, Hubbard, Lewis, Newell, Page, Sprague, Tower, Wilder, Wilkinson and Wood, it was unanimously resolved, That it is the prime object of the Board of Agriculture, in the management of the farm at Westborough, to second the benevolent efforts of the founder of the State Reform School, and that the constant and moderate employment of the boys in the open air, to an extent as great as is practicable, is equally the desire of the Board of Agriculture as of the Trustees of that institution.

A committee was accordingly appointed to confer with the Trustees on the subject, with power to make such arrangements in the premises as might be mutually satisfactory. This committee, consisting of Messrs. Sprague, Brown and Clapp, having attended to its duty, submitted the following Special Agreement:—

Westborough, April 4, 1855.

It is mutually agreed by and between the Committee of the State Board of Agriculture and the Committee of the Trustees of the State Reform School, on the subject of the employment of the boys upon the farm, as follows, viz. :—

That one hundred and fifty boys shall be employed upon the farm each work day during the present season and so long as the ground shall remain open for farm work, stormy days excepted; and additional boys shall be furnished upon notice to the Superintendent, so far as the condition of the school will permit; the Superintendent, under the direction of the Trustees, to select the boys and to take care to furnish a reasonable proportion of boys of suitable size and ability to drive team, dump carts, and do ordinary farm work; and that all teaming for the school, except such as can be done by the horses necessarily kept by the institution, shall be done by the head farmer; that it shall be the duty of the Superintendent and head farmer to keep and render accounts of the number of boys employed, and of the work done and products furnished; and the two Boards will in all cases fix the prices, and the Superintendent and head farmer will govern themselves accordingly.

(Signed) Seth Sprague,
Simon Brown,
Henry W. Clapp,
Committee of the Board of Agriculture.

J. H. W. Page,
Harvey Dodge,
Committee of Trustees of the State Reform School.

This agreement was carried into effect as soon as practicable, and though so large a number of boys could not be advantageously or profitably employed, still the grand object of furnishing them with healthful exercise and occupation was attained. It will be seen that the farm, by this arrangement, is charged with a large amount of labor which it cannot make immediately available as a means of reducing its expenses.

At a meeting held at the State House on the 5th of December, the Committee on Stock, charged with the purchase, sale and feeding of the same, submitted the following

Statement (1) *of Milk, Food, &c., of Cows, from February* 1 *to February* 20, *both inclusive*—20 *days*—1855.

NAMES.	Age of Cows.	Average morn'g & eve'g weight, Feb. 1, 1855.	Average morn'g & eve'g weight, Feb 20, 1855.	Kinds of food, and average quantity consumed daily in 20 days.					Daily flow of milk—average for 20 days.	Per cent. of milk on live weight of cow.	Days after calving.
				Hay—lbs.	Straw—lbs.	Fodder—lbs.	Carrots—lbs.	Cob meal—lbs.			
Chamberlin, . .	8	1017	1018	8.50	5.75	4.37	20.00	5.00	16.19	1.59	153
Delia, ...	8	1002	975	8.50	5.75	4.37	20.00	5.00	19.19	1 94	72
Gentle, ...	10	965	940	8.50	5.75	4.37	20.00	5.00	17.69	1.85	123
Fanny, ...	11	955	902	8.50	5.75	4.37	20.00	5.00	18.06	1.90	70
Flora, ...	6	968	922	8.50	5.75	4.37	20.00	5.00	28.56	3.02	59
Rosa, ...	10	975	930	8.50	5.75	4.37	20.00	5.00	27.31	2.88	53
Haywood, . . .	10	944	926	8.50	5.75	4.37	20.00	5.00	19.31	2.08	69
Spot, ...	7	852	820	8.50	5 75	4.37	20.00	5.00	15.44	1.91	122
Redneck, . . .	6	832	798	8.50	5.75	4.37	20.00	5.00	21.44	2.65	61
Kendall, . . .	9	1117	1122	11.80	5.00	4.00	–	–	dry.	–	–
Dolly, ...	11	1207	1201	11.80	5.00	4.00	–	–	dry.	–	–
Star, ...	11	1125	1162	11.80	5.00	4.00	–	–	dry.	–	–
Bunty, ...	6	925	928	8.50	5.75	4.00	20.00	5.00	11.00	1.18	112
Whiteface, . . .	6	733	710	8 50	5.75	4.00	20.00	5.00	21.37	2.96	64
Redheifer, . . .	6	971	964	11.80	5.00	4.00	–	–	dry.	–	–
Gentle, 2d, . . .	6	945	963	11.80	5.00	4.00	–	–	dry.	–	–
Cherry, ...	6	955	961	11.80	5.00	4.00	–	–	dry.	–	–
Sawyer, ...	6	1047	1030	11.80	5.00	4.00	–	–	dry.	–	–
Lady Devon, . .	5	960	937	8.50	5.94	4.00	20.00	5.00	10.94	1.13	170
Jenny Lind, . .	2	702	653	8.50	5.75	4.37	20.00	5.00	15.75	2.32	50

Statement (2) *of Milk, Food, &c., of Cows, from February* 21, *to March* 12, *both inclusive.*

NAMES.	Age.	Average morning and evening weight, Feb. 20, 1855.	Average morning and evening weight, M'ch 12, 1855.	Kinds of food, and average daily quantity consumed in 20 days.				Average daily flow of milk for 20 days—lbs.	Per cent of milk on live weight of cow.	Days after calving.
				Meadow Hay—lbs.	Corn Fodder—lbs.	Carrots—lbs.	Cobb Meal—lbs.			
Chamberlin, . .	8	1,018	1,030	11.31	11.31	25.00	5.00	16.13	1.58	173
Delia, ...	8	975	956	11.31	11.31	25.00	5.00	18.00	1.86	92
Gentle, . . .	10	940	916	10.56	10.56	25.00	5.00	17.25	1.89	143
Fanny, ...	11	902	902	10.63	10.63	25.00	5.00	17.00	1.88	90
Flora, ...	6	922	912	10.75	10.75	25.00	5.00	26 63	2.85	79
Rosa, ...	10	930	903	10.88	10.88	25.00	5.00	24.07	2.63	73
Haywood, . . .	10	926	944	10.75	10.75	25.00	5.00	18.13	1.95	89
Spot, ...	7	820	828	10.25	10.25	25.00	5.00	14.37	1.74	142
Redneck, . . .	6	798	784	10.33	10.33	25.00	5.00	19.37	2.45	81
Kendall, . . .	9	1,122	1,115	13.06	13.06	20.00	–	dry.	–	–
Dolly, ...	11	1,201	1,219	13.37	13.37	20.00	–	dry.	–	–
Star, ...	11	1,162	1,169	12.88	12.88	20.00	–	dry.	–	–
Bunty, ...	6	928	946	10.19	10.19	25.00	5.00	10.88	1.16	132
Whiteface, . .	6	710	686	10.19	10.19	25.00	5.00	18.69	2.68	84
Redheifer, . .	6	964	975	11.94	11.94	20.00	–	dry.	–	–
Gentle, 2d, . .	6	963	1,024	12.75	12.75	20.00	–	dry.	–	–
Cherry, . . .	6	961	967	12.31	12.31	20.00	–	dry.	–	–
Sawyer, . . .	6	1,030	893	13.31	13.31	20.00	–	dry.	–	–
Lady Devon, . .	5	937	932	9.75	9.75	25.00	5.00	10.13	1.08	190
Jenny Lind, . .	2	653	651	10.25	10.25	25.00	5.00	14.19	2.17	70

Statement (3) *of Milk, Food, &c., of Cows, from March* 13, *to April* 1, *both inclusive—*20 *days.*

NAMES.	Age.	Average morning and evening weight, March 13, 1855	Average morning and evening weight, April 1, 1855.	Kinds of food, and average daily quantity consumed in 20 days.				Average daily flow of milk for 20 days—lbs	Per cent. of milk on live weight of cow.	Days after calving.
				Meadow Hay—lbs.	Corn Fodder—lbs.	Carrots—lbs.	Cob Meal—lbs.			
Chamberlin, . .	8	1,030	1,022	10.37	10.37	10.00	6.50	16.56	1.61	193
Delia, ...	8	956	938	9.50	9.50	10.00	6.50	17.56	1.85	112
Gentle, . . .	10	916	903	9.37	9.37	10.00	6 50	17.19	1.89	163
Fanny, ...	11	902	890	9.56	9.56	10 00	6.50	16 44	1.80	110
Flora, ...	6	912	863	9.75	9.75	10.00	6.50	24 56	2.76	99
Rosa, ...	10	903	890	9.31	9.31	10.00	6.50	22.56	2.52	93
Haywood, . .	10	944	908	8 88	8 88	10.00	6.50	17.80	1.82	109
Spot, ...	7	828	823	9.50	9.50	10 00	6.50	13 75	1.66	162
Redneck, . . .	6	784	760	9.44	9.44	10.00	6.50	16.63	2.14	101
Kendall, . . .	9	1,115	938	12.00	12.00	–	–	dry.	–	7
Dolly, ...	11	1,219	1,235	11.63	11.63	–	–	dry.	–	–
Star, ...	11	1,169	1,250	11.13	11.13	–	–	dry.	–	–
Bunty, ...	6	946	945	10.13	10.13	10.00	6 50	10.75	1.14	152
Whiteface, . .	6	686	673	10.13	10.13	10.00	6.50	17.13	2.52	102
Redheifer, . .	6	975	965	11.37	11.37	–	–	dry.	–	–
Gentle, 2d, . .	6	1,024	1,045	12.31	12.31	–	–	dry.	–	–
Cherry, . . .	6	967	950	11.44	11.44	–	–	dry	–	–
Sawyer, . . .	6	893	860	9.37	9.37	10.00	6.50	22.75	2.59	18
Lady Devon, . .	5	932	923	9.80	9.80	10.00	6.50	9 75	1.05	210
Jenny Lind, . .	2	651	627	9.80	9.80	10.00	6.50	12.94	2.02	90
Alice, ...	–	985	–	–	–	–	–	–	–	–

Statement (4) *of Milk, Food, &c., of Cows, from April* 2, *to April* 21, *both inclusive*—20 *days.*

NAMES.	Age.	Average morning and evening weight, April 2, 1855.	Average morning and evening weight, April 21, 1855.	Kinds of food, and average daily quantity consumed in 20 days.		Average daily flow of milk in 20 days.	Per cent. of milk on live weight of cow.	Days after calving.
				Cut Meadow Hay—lbs.	Cob Meal—lbs.			
Chamberlin, . .	8	1,022	1,013	19.40	7.50	13.40	1.34	213
Delia, ...	8	938	910	17.40	7.00	15.63	1.59	132
Gentle, . . .	10	903	865	17.40	6.75	15.50	1.55	183
Fanny, ...	11	890	885	16.40	6.50	12.90	1.46	130
Flora, ...	6	863	865	16.40	6.50	20.29	2.35	119
Rosa, ...	10	890	860	16.40	6.75	19.90	2.27	113
Haywood, . .	10	908	890	17.40	6.75	15.01	1.67	129
Spot, ...	7	823	765	15.40	6.25	12.23	1.58	182
Redneck, . . .	6	760	780	14.50	5.50	14.66	2.00	121
Kendall, . . .	9	938	945	17.40	7.00	29.59	2.19	27
Dolly, ...	11	1,235	1,250	22.80	3.00	dry.	–	–
Star, ...	11	1,250	1,020	18.10	2.50	dry.	–	–
Bunty, ...	6	945	955	17.40	7.00	9.10	1.00	172
Whiteface, . .	6	673	655	14.30	5.00	12.16	1 83	122
Redheifer, . .	6	965	875	19.20	2.50	dry.	–	–
Gentle, 2d, . .	6	1,045	1,050	19.50	3.00	dry.	–	–
Cherry, . . .		950	850	21.30	3.00	dry.	–	–
Sawyer, . . .	6	860	840	16.40	6.00	18.04	2.12	38
Lady Devon, . .	5	923	940	17.40	7.00	9.13	1.00	230
Jenny Lind, . .	2	627	635	11.70	4.50	9.64	1.53	110
Alice, ...	–	985	985	–	–	dry.	–	–

Statement (5) *of Milk, Food, &c., of Cows, from April* 22, *to May* 11, *both inclusive*—20 *days.*

NAMES.	Age.	Average morning and evening weight, April 22, 1855.	Average morning and evening weight, May 11, 1855.	Kind of food, & average daily quantity consumed in 20 days. Cut English Hay—lbs.	Average daily flow of milk for 20 days.	Per cent. of milk on live weight of cow.	Days after calving.
Chamberlin, . .	8	1,013	1,125	24.18	8.37	0.78	233
Delia, ...	8	910	1,015	23.59	14.37	1.49	152
Gentle, . . .	10	865	980	23.53	13.84	1.50	203
Fanny, ...	11	885	978	23.47	13.13	1.41	150
Flora, ...	6	865	948	22.44	18.50	2.00	139
Rosa, ...	10	860	973	23.94	16.75	1.83	133
Haywood, . .	10	890	983	23.12	14.12	1.51	149
Spot, ...	7	765	863	23.24	12.12	1.49	202
Redneck, . . .	6	780	833	23.24	13.63	1.69	141
Kendall, . . .	9	945	1,007	24.29	19.00	2.00	47
Dolly, ...	11	1,250	1,303	25.18	dry.	–	–
Star, ...	11	1,020	1,015	24.12	21.70	2.13	59
Bunty, ...	6	955	1,023	23.14	7.26	0.73	192
Whiteface, . .	6	655	740	23.65	12.44	1.80	142
Redheifer, . .	6	875	850	23.06	20.12	2.33	59
Gentle, 2d, . .	6	1,050	1,095	24.24	dry.	–	–
Cherry, . . .	6	850	838	25.00	suckling.	–	48
Sawyer, . . .	6	840	905	23.94	17.92	2.06	58
Lady Devon, . .	5	940	993	23.65	7.43	0.77	250
Jenny Lind, . .	2	635	673	17.77	7.82	1.19	139
Alice, ...	–	985	1,000	–	–	–	–

Statement (6) of Milk, Food, &c., of Cows, from June 13, to July 2, both inclusive—20 days.*

NAMES.	Age.	Average morning and evening weight, June 13, 1855.	Average morning and evening weight, July 2, 1855.	Average daily flow of milk for 20 days.	Percent. of milk on live weight of cow.	Days after calving.
Chamberlin,	8	1,125	1,062	10.60	0.97	265
Delia,	8	1,015	972	13.75	1.38	184
Gentle,	10	980	925	17.44	1.83	235
Fanny,	11	978	970	14.44	1.48	182
Flora,	6	948	912	22.38	2.40	171
Rosa,	10	973	920	19.37	2 04	165
Haywood,	10	983	897	22.31	2.25	181
Spot,	7	863	835	13.81	1.63	234
Redneck,	6	833	800	15.43	1.89	173
Kendall,	9	1,007	975	14.17	1.43	79
Dolly,	11	1,303	1,140	dry.	–	–
Star,	11	1,015	960	20.62	2.89	91
Bunty,	6	1,023	967	5.75	0 58	224
Whiteface,	6	740	737	17.36	2.35	174
Redheifer,	6	850	842	21.75	2.57	91
Gentle, 2d,	6	1,095	902	29.12	2.92	19
Cherry,	6	838	815	21.70	2.63	80
Sawyer,	6	905	870	19.25	2.17	90
Lady Devon,	5	993	957	7.02	0.72	282
Jenny Lind,	2	673	652	9.67	1.44	171
Alice,	–	1,000	–	–	–	–

* Pasture grass.

Statement (7) of Milk, Food, &c., of Cows, from July 3, to July 22, both inclusive.*

NAMES.	Age.	Average morning and evening weight, July 2, 1855.	Average morning and evening weight, July 22, 1855.	Average daily flow of milk for 20 days.	Per cent. of milk on live weight of cow.	Days after calving.
Chamberlin,	8	1,062	1,080	8.14	0.76	285
Delia,	8	972	1,015	13.12	1.32	204
Gentle,	10	925	957	13.56	1.44	255
Fanny,	11	970	980	14.30	1.47	202
Flora,	6	912	944	21.04	2.26	191
Rosa,	10	920	968	19.25	2.05	185
Haywood,	10	897	988	16.29	1.73	201
Spot,	7	835	890	13.79	1.60	254
Redneck,	6	800	818	14.76	1.83	193
Kendall,	9	975	980	20.20	2.06	79
Dolly,	11	1,140	1,119	18.88	1.67	55
Star,	11	960	995	17.96	1.84	111
Bunty,	6	967	–	dry.	–	244
Whiteface,	6	737	768	17.06	2.27	194
Redheifer,	6	842	859	18.96	2.23	111
Gentle, 2d,	6	902	906	25.91	2.87	39
Cherry,	6	815	809	17.60	2.17	100
Sawyer,	6	870	884	17.52	2.00	111
Lady Devon,	5	957	–	dry.	–	–
Jenny Lind,	2	652	706	10.57	1.56	191
Alice,	–	–	–	–	–	–

* Pasture grass.

Statement (8) *of Milk, Food,* &c., of Cows, from July* 23, *to August* 11, *both inclusive—20 days.*

NAMES.	Age.	Average morning and evening weight, July 23, 1855.	Average morning and evening weight, August 11, 1855.	Average daily flow of milk for 20 days.	Percent. of milk on live weight of cow.	Days after calving.
Chamberlin,	8	1,080	1,122	8.16	0.74	305
Delia,	8	1,015	981	10.79	1.08	224
Gentle,	10	957	972	12.25	1.27	275
Fanny,	11	980	971	12.47	1.28	222
Flora,	6	944	957	21.83	2.30	211
Rosa,	19	968	922	16.39	1.74	205
Haywood,	10	988	990	14.97	1.52	221
Spot,	7	890	900	11.93	1.33	274
Redneck,	6	818	855	13.97	1.67	213
Kendall,	9	980	967	17.88	1 84	99
Dolly,	11	1,119	1,125	17.60	1.57	75
Star,	11	995	1,010	17.79	1 78	131
Whiteface,	6	768	782	18.20	2.35	214
Bunty, (slaughtered.)	–	–	–	–	–	–
Redheifer,	6	859	842	17.51	2.06	131
Gentle, 2d,	6	906	912	23 92	2.63	59
Cherry,	6	809	812	16.79	2.07	120
Sawyer,	6	884	872	17.52	2.00	131
Lady Devon,	5	–	–	–	–	–
Jenny Lind,	2	706	682	10.02	1.53	211
Alice,	–	860	907	31.05	3.52	25

* Pasture grass.

Statement (9) *of Milk, Food,* &c., of Cows, from August* 12, *to August* 31, *both inclusive—20 days.*

NAMES.	Age.	Average morning and evening weight, Aug. 12, 1855.	Average morning and evening weight, Aug. 31, 1855.	Average daily flow of milk for 20 days.	Per cent of milk on live weight of cow.	Days after calving.
Chamberlin,	8	1,122	1,167	5.85	0.51	325
Delia,	8	981	1,077	10.73	1.04	244
Gentle,	10	972	1,050	11.39	1.13	295
Fanny,	11	971	1,055	12,47	1.23	242
Flora,	6	957	1,010	22.50	2.28	231
Rosa,	10	922	1,045	15.86	1.61	225
Haywood,	10	990	1,062	15.22	1.48	241
Spot,	7	900	962	11.32	1.22	294
Redneck,	6	855	922	14.36	1.62	233
Kendall,	9	967	1,025	17.81	1.79	119
Dolly,	11	1,125	1,155	17.83	1.57	95
Star,	11	1,010	1,040	18 33	1.79	151
Whiteface,	6	782	835	17.64	21.18	234
Redheifer,	6	842	885	17.95	2.08	151
Gentle, 2d,	6	912	942	23.95	2.58	79
Cherry,	6	812	850	17.40	2.09	140
Sawyer,	6	872	942	17.06	1.88	151
Lady Devon,	5	dry.	–	dry.	–	–
Jenny Lind,	2	682	685	10.58	1.55	231
Alice,	–	907	835	31.11	3.57	45

*Pasture grass.

Statement (10) *of Milk, Food,* &c., of Cows, from September* 1, *to September* 20, *both inclusive—*20 *days.*

NAMES.	Age.	Average morning and evening weight, September 1, 1855.	Average morning and evening weight, September 20, 1855.	Average daily flow of milk for 20 days.	Percent. of milk on live weight of cow.	Days after calving.
Delia,	8	1,077	1,035	6.91	0.60	244
Gentle,	10	1,050	1,052	9.31	0.88	315
Fanny,	11	1,055	967	9.33	0.92	262
Flora,	6	1,010	970	18.08	1.83	251
Rosa,	10	1,045	1,045	10.56	1.01	245
Haywood,	10	1,062	1,022	9.02	0.87	261
Spot,	7	962	935	6.94	0.73	314
Redneck,	6	922	915	8.05	0.88	253
Kendall,	9	1,025	990	16.72	1.66	139
Dolly,	11	1,155	1,160	16.62	1.44	115
Star,	11	1,040	950	15.61	1.57	171
Whiteface,	6	835	795	14.45	1.78	254
Redheifer,	6	885	860	18.39	2.11	171
Gentle, 2d,	6	942	900	20.04	2.18	99
Cherry,	6	850	820	15.03	1.80	160
Sawyer,	6	942	917	15.56	1.67	171
Lady Devon,	5	dry.	–	–	–	–
Jenny Lind,	2	685	657	8.51	1.27	251
Alice,	–	835	802	25.00	3.06	65

*Pasture grass and corn fodder.

Statement (11) *of Milk, Food,* &c., of Cows, from September* 21, *to October* 10, *both inclusive—*20 *days.*

NAMES.	Age.	Average morning and evening weight, September 21, 1855.	Average morning and evening weight, Oct. 10, 1855.	Average daily flow of milk for 20 days.	Per cent. of milk on live weight of cow.	Days after calving.
Gentle,	10	1,052	1,062	8.09	0.77	284
Fanny,	11	967	1,022	9.13	0.92	335
Flora,	6	1,045	1,016	10.74	1.08	282
Rosa,	10	–	–	–	–	–
Haywood,	10	–	–	–	–	–
Spot,	7	–	–	–	–	–
Redneck,	6	–	–	–	–	–
Kendall,	9	990	1,035	15.15	1.50	159
Dolly,	11	1,115	1,171	15.60	1.37	135
Star,	11	950	1,030	11.70	1.18	191
Whiteface,	6	795	864	9.93	1.20	274
Redheifer,	6	860	863	15.48	1.80	191
Gentle, 2d,	6	900	920	16.47	1.81	119
Cherry,	6	820	843	14.28	1.72	180
Sawyer,	6	917	935	14.24	1.54	191
Lady Devon,	5	dry.	–	–	–	–
Alice,	4	802	873	23.40	2.80	85

* Pasture grass and corn fodder.

Statement (12) *of Milk, Food,* &c., of Cows, from October* 11, *to October* 30, *both inclusive—20 days.*

NAMES.	Age.	Average morning and evening weight, Oct. 11, 1855.	Average morning and evening weight, Oct. 30, 1855.	Average daily flow of milk for 20 days.	Per cent. of milk on live weight of cow.	Days after calving.
Gentle,	10	1,062	1,117	5.33	0.49	304
Fanny,	11	1,023	1,060	7.74	0.74	355
Flora,	6	1,016	1,025	7.29	0.71	302
Rosa,	10	–	–	dry.	–	–
Haywood,	10	–	–	dry.	–	–
Star,	7	–	–	dry.	–	–
Redneck,	6	–	–	dry.	–	–
Kendall,	9	1,035	1,100	13.56	1.27	179
Dolly,	11	1,171	1,190	13.75	1.17	155
Star,	11	1,030	1,102	8.00	0.75	211
Whiteface,	6	864	870	4.33	0.50	294
Redheifer,	6	863	878	12.47	1.43	211
Gentle, 2d,	6	920	930	13.28	1.41	139
Cherry,	6	843	852	12.74	1.50	200
Sawyer,	6	935	980	10.85	1.13	211
Lady Devon,	5	–	982	suckling.	–	–
Alice,	4	873	878	17.86	2.04	105

* Fall feed, and one bushel of pumpkins, daily.

Statement (13) *of Milk, Food,* &c., of Cows, from October* 31, *to November* 19, *both inclusive—20 days.*

NAMES.	Age.	Average morning and evening weight, Oct. 31, 1855.	Average morning and evening weight, Nov. 19, 1855.	Average daily flow of milk for 20 days.	Per cent. of milk on live weight of cow.	Days after calving.
Gentle,	10	1,117	–	1.20	–	324
Fanny,	11	1,060	–	3.26	–	375
Kendall,	9	1,100	–	10.38	–	199
Dolly,	11	1,190	–	11.78	–	195
Star,	11	1,102	–	5.70	–	231
Redheifer,	6	878	–	11.80	–	231
Gentle, 2d,	6	930	–	11.67	–	159
Cherry,	6	852	–	10.73	–	220
Sawyer,	6	980	–	9.20	–	231
Lady Devon,	5	982	–	23.14	–	–
Alice,	4	878	–	17.09	–	125
Milton,	5	1,207	–	7.76	–	304

(1.) Thirteen of these cows gave, in twenty days, four thousand eight hundred and forty-five pounds of milk, and consumed, in the same twenty days,

2,210	pounds of	meadow hay, at	$9 00	the ton,	$9 94
1,498	"	oat straw, at	6 00	"	4 49
1,110	"	corn fodder, at	7 00	"	3 89
1,300	"	cob meal, at	01.4	the pound,	18 20
5,200	"	carrots, at	00.5	"	26 00
Cost of food consumed by these 13 cows in 20 days,					$62 52

Cost of milk the pound, 1.29 cents, or 12.90 cents the gallon of ten pounds.

* Refuse cabbages, tops of roots, husks and pasture grass.

(2.) These thirteen cows are the same as were in the last trial, and they gave, in this twenty days, four thousand four hundred and ninety-seven pounds of milk, and have consumed, in this twenty days,

2,743	pounds of meadow hay, at	$9 00	the ton, . .	$12 34
2,743	" corn fodder, at	7 00	" . .	9 60
1,300	" cob meal, at	01.4	the pound, .	18 20
6,500	" carrots, at	00.5	" .	32 50
	Cost of food consumed in 20 days by these 13 cows,			$72 64

Cost of milk the pound, a fraction over 1.619 cents, or 16.19 cents the gallon of ten pounds.

(3.) In this trial there were fourteen cows, thirteen the same that were in the last trial, and one new milch cow, eighteen days after parturition. The fourteen gave, in twenty days, four thousand seven hundred and twenty-seven pounds of milk, and consumed, in the same twenty days,

2,698	pounds of meadow hay, at	$9 00	the ton, . .	$12 14
2,698	" corn fodder, at	7 00	" . .	9 44
1,820	" cob meal, at	01.4	the pound, .	25 48
2,800	" carrots, at	00.5	" .	14 00
	Cost of food consumed in 20 days by these 14 cows,			. $61 06

Cost of milk the pound, a fraction less than 1.291 cents the pound, or 12.91 cents the gallon of ten pounds.

(4.) In this trial were fifteen cows, fourteen the same that were in the last trial, and one new milch cow, thirty-eight days from calving. The fifteen gave, in twenty days, four thousand five hundred and forty-three pounds of milk, and consumed, in the same time,

4,906	pounds of meadow hay, at	$9 00	the ton, . .	$22 07
1,920	" cob meal, at	01.40	the pound, .	26 88
	Cost of food consumed in 20 days by these 15 cows,			. $48 95

Cost of milk the pound, a fraction less than 1.077 cents, or 10.77 cents the gallon of ten pounds.

The meadow hay grown upon the farm, and fed to the cows in these trials, contains, by analysis made by Professor Horsford, only one-third the nutritive value of good upland hay, by this test is worth for feeding only about five dollars the ton, instead of nine, as estimated by the committee.

(5.) In this trial were seventeen cows, fifteen were in the last trial, and two milch cows. The seventeen gave, in the twenty days, four thousand seven hundred and seventy pounds of milk, and consumed 7,887 pounds of cut English hay, at $15 the ton, $59.15.

Cost of milk, 1.24 cents the pound, or 12.40 cents the gallon of ten pounds.

From May 11, to June 13, the cows were turned to pasture during a part of the day, and no account of food or milk was kept.

(6.) These nineteen cows, during the twenty days of trial, gave six thousand three hundred and eighteen pounds of milk. Their food was grass, and, estimating pasture land at forty dollars the acre, and five acres to the cow, for six months in the year, the cost of keeping each cow, for twenty days, would be the interest and taxes on five acres of land, valued at two hundred dollars.

Interest one year, on $200, cost of land, . .	$12 00
Taxes, ...	1 00
	$13 00

Thirteen dollars, divided by 182 days, gives 7.14 cents a day for the keeping of one cow, or $1.43 for twenty days, or $27.17 for keep of nineteen cows for twenty days.

Cost of milk the pound, a fraction over $\frac{43}{100}$ of a cent, or 4.30 cents the gallon of ten pounds.

(7.) The eighteen cows in this trial gave, in twenty days, five thousand nine hundred and seventy-eight pounds of milk.

Estimating the cost of keeping each cow, at $1.43 for twenty days, the same as in the last trial, the milk in this trial will cost a fraction less than $\frac{43}{100}$ of a cent the pound, or 4.30 cents the gallon of ten pounds.

(8.) Nineteen cows in this trial gave, in twenty days, six thousand two hundred and twenty pounds of milk.

Keeping, same as the two last trials, $1.43 for twenty days, each cow, or $27.17 for the nineteen cows for twenty days; making cost of the milk 4.37 cents the gallon of ten pounds.

(9.) Nineteen cows in this trial gave, in twenty days, six thousand one hundred and eighty-seven pounds of milk.

Keeping, same as last trial, $1.43 for twenty days, each cow, or $27.19 for the nineteen; making cost of milk 4.35 cents the gallon of ten pounds.

(10.) The eighteen cows in this trial gave, in twenty days, four thousand eight hundred and eighty-two pounds of milk.

The feed in this trial was grass, with the exception of a small quantity daily, of green corn fodder, to make up the deficiency in the pasturage, caused by dry weather; the cost of keeping may, therefore, be fairly set the same as in the last trial, $1.43 for each cow, twenty days; eighteen cows, twenty days, $25.74, making the milk cost 5.27 cents the gallon of ten pounds.

(11.) Twelve cows in this trial gave, in twenty days, three thousand two hundred and eighty-four pounds of milk.

The cost of keep, $1.43 each, was, for twenty days, the same as last trial; twelve cows, for twenty days, would amount to $17.16, and the milk in this trial will cost 5.23 cents the gallon of ten pounds.

(12.) The twelve cows in this trial gave, in twenty days, two thousand five hundred and forty-four pounds of milk.

Estimating the aftermath feed to be equal to good pasture, and the one bushel of pumpkins to be worth three cents, the cost of keeping each cow, twenty days, would be $2.03; for twelve cows the cost of keep for twenty days would amount to $24.36; the cost of milk the pound, .957 cents, or 9.57 cents the gallon of ten pounds.

(13.) Twelve cows in this trial gave, in twenty days, two thousand four hundred and seventy-four pounds of milk.

The cost of food the same as in the last trial, say $2.03 each cow, for twenty days, or $24.36 for twelve cows, for twenty days; cost of milk, 9.84 cents the gallon of ten pounds.

(14.) The milk given by these cows in the thirteen trials of two hundred and sixty days, was sixty-one thousand two hundred and sixty-nine pounds, which cost $503.19, or 8.21 cents the gallon of ten pounds.

Average number of cows milking daily, . . 15.46
Average flow of milk daily, ... 235.65 pounds.

Average number of pounds of milk given by each cow daily throughout the two hundred and sixty days, ... 15.24 pounds.

Average number of days after calving, one hundred and sixty-six and $\frac{25}{100}$.

In pursuance of a vote passed at the last annual meeting of the Board, the Committee on Stock have purchased an imported Hereford cow, five years old, with her calf, eight months old, for which they paid two hundred and ninety dollars. This cow received the first premium of one hundred dollars, as the best Hereford cow at the show of the United States Agricultural Society, at Boston, in October last. The Hon. J. C. Gray has presented to the Board a very fine Jersey bull calf, for which the thanks of the Board are due. The thanks of the Board are also due to the Massachusetts Society for the Promotion of Agriculture, for a very beautiful Jersey cow, which proves excellent for milk, but not so good for butter as the reputation of that breed might warrant us in expecting; she gave, from the fifteenth of October to the twenty-second, seven days, one hundred and forty-one and three-quarter pounds of milk, which was manufactured by Mrs. Brigham, an experienced lady in the dairy, and produced eighteen pounds of cream, which made seven and one-half pounds of excellent butter. Five and twenty-two hundredths per cent. of the milk was butter. The Board have also to acknowledge a gift from Thomas Motley, Jr., Esq., of a full blood imported Suffolk boar, which proves an excellent animal. H. W. Clapp, of Greenfield, has donated to the Board two pigs, a male and a female, of mixed Suffolk, and Mackay breed, for which the thanks of the Board are due.

There has been some change within the last year in the live stock upon the farm, by slaughter and purchase, which will fully appear in the Secretary's account. We have been unfortunate the past year in swine, by the loss by death of fifty or more young pigs; the Committee, however, believe that the Treasurer's account will show some gain in that department.

The last year the Committee were obliged to expend $335.07 in the purchase of hay, and the hire of pasturage to sustain the stock necessary to supply the institution with milk, and the farm with ox and horse labor. To save this expenditure the present year, the Committee rented a neighboring farm, from which they have obtained more fodder and pasturage than was purchased the last year, and after paying the labor and expense of cultivation, and $600 rent, have a surplus as profit, of $442.64.

JOHN BROOKS.
MOSES NEWELL.

It was the design of the Board to procure good specimens of each of the prominent breeds of animals, in order to test, so far as practicable, the comparative merits of each in a perfectly

fair and impartial manner. This object, so desirable in itself, and so important for the interests of agriculture in all parts of the State, has, as yet, been but partially attained in the beautiful Herefords and Jerseys alluded to in the report of the Committee. Few experiments in this direction have ever been made in so thorough a manner as to commend them to the confidence of practical farmers. The breeder of any particular class—like the Devons or Durhams—is so far an interested party as very naturally to laud it, without, perhaps, any improper motive. Few men have ever kept a considerable variety of breeds, subjected to precisely similar circumstances of food and shelter, for the purpose mainly of ascertaining the comparative results in milk or labor. This experiment the State can, and it is thought ought to make, at the farm, where the expense can, in any event, be but trifling, since a certain number of animals of some kind must be kept there. The Committee on Stock will spare no pains to accomplish this object in the most satisfactory manner.

The Committee on Labor, charged with employment and control of all the labor on the farm, submitted the following

REPORT:

The labor and business of the farm has been carried on by Samuel N. White, head farmer, with four monthly men in the winter and eight monthly men in summer, at from $16 to $22 per month. Five day laborers, equal to six months each, at $1.50 per day.

Monthly labor for the year ending November 30, 1855,	$1,624 31
Day labor for the year, ...	1,149 39
Boys, 25,651 days for the year, at 10 cents, . . .	2,565 10
Board of men, at $3 per week, ...	790 52
Head farmer's salary, exclusive of house rent, vegetables, &c., worth $150, ...	650 00
Whole expense of labor for all purposes, . .	$6,779 32
Of the above there has been expended on permanent improvements, and chargeable to that department, .	3,349 10
	$3,430 22
The labor on the Fay Farm is included in the above, of the produce of which a separate account has been kept,	266 00
Leaving the expense of labor on the farm, . .	$3,164 22

It will be seen that the wages paid for labor are very high; under ordinary circumstances we think the same labor might be done for one-fourth less money. But as the farm is connected with the institution for the reform of six hundred convict boys, we deem it our duty to employ help of a character to carry out the benevolent designs of its founders.

The number of boys employed has averaged eighty-three per day, for the whole year. During the summer one hundred and fifty per day have been employed; many of them are small and cannot do work enough to pay the overseeing. There can be no doubt that the health and good of the boys require out-door exercise. But the Board should not be held responsible for a lack of economical management in the expenses of the farm; the wages allowed so many small boys cannot be less than $1,000 more than the profit of their labor warrants. The want of suitable accommodations for boarding the men is a serious inconvenience, which we hope will soon find a remedy in some way, by the Legislature.

Respectfully submitted,

SETH SPRAGUE,
SAMUEL CHANDLER,
Committee on Labor.

The Committee on General Improvements, Farm Arrangements, Plans, &c., at this meeting, submitted the following

REPORT:

On the work done to improve the land below the farm house, directly west of the town road.

There has a been a trench dug, running east and west, thirty-eight rods long, eight feet wide, five and a half feet deep, filled with stone four feet deep, and covered with earth one and a half feet. This trench took 1,254 perch of stone to fill it.

Another trench was opened for a road-way from the barn towards the institution, twenty rods in length, ten feet wide, four and a half deep, filled with stone three feet deep, covered with earth one and a half feet, and taking 620 perch of stone.

For the work done, the expenses have been as follows:—

169	days' work	of men, ...		$280 65
2,264	"	" of boys, ...		226 40
91	"	" of oxen, ...		136 50

Powder and fuse,	18 00
Iron bars,	12 00
Drills,	4 00
Repairing chains,	6 00
	$683 55

The foregoing items of expense we have required the farmer to furnish, and we think there ought to be at least $50 added for wear and tear of carts, stone-boats, shovels, hoes, &c., as well as $50 for his own time; making the entire expenses $783.50.

The improvements on the Warren Lot, so called, containing three and a half acres, so far as it has been operated on, have cost as follows:—

Labor of men 168 days,	$252 00
" boys, 6,989 days,	698 90
" oxen, $1\frac{1}{3}$ days,	2 00
Powder and fuse,	3 25
Picks,	14 00
Repairs,	9 00
Iron Bars,	5 00
	$984 15

For construction of reservoir and road, as follows:—

Cost of digging,	$193 60
" " drain,	60 20
" cleaning in spring,	40 20
" drawing stone, building wall and blasting,	527 70
" cement,	91 50
" 1,200 bricks,	73 80
" laying drain,	45 75
" plank for floors,	13 64
" building,	5 00
" iron pipe,	12 00
" gate and pipe,	16 35
" putting in pipe and gate,	4 00
" road across meadow,	31 00
Total cost of reservoir and fixtures,	$1,114 74

Dec. 4, amount expended in constructing drain by barn and piggery,	$72 30
Amount expended in clearing the land front of farm house, making drain and road,	783 50
Improvement on the Warren Lot,	984 15
Constructing reservoir,	1,114 74
	$2,954 69

All of which is most respectfully submitted,

B. V. FRENCH,
SIMON BROWN,
HENRY W. CLAPP,
Committee.

The Committee on Crops, Fertilizers, &c., submitted the following

REPORT:

Your Committee on Crops, &c., beg leave to report the following as the amount of crops for 1855:—

Potatoes,	1,647 bushels.
Carrots,	2,470 "
Turnips,	1,002 "
Onions,	461 "
Beets,	231 "
Parsnips,	93 "
Total of Potatoes and other roots,	5,904 "
Corn, shelled,	982 bushels.
Oats,	286 "
Rye,	150 "
Beans,	60 "
Total of Corn, Oats, Rye and Beans,	1,478 "
Hay,	103 tons.
Millet, cured as hay,	$\frac{3}{4}$ "
Corn Fodder,	30 "
Total of Corn Fodder, Hay, &c.,	$133\frac{3}{4}$ "
Cabbages,	5,000 heads.
Fruits—Apples, 50; Pears, 10,	60 bushels.

The above aggregate is collected from the records of S. N. White, Esq., head farmer of the State Farm. A more detailed account of crops and fertilizers will be found in his statements, as given below. It will be understood that the designations, Sibley Farm, Warren Lot, &c., refer to different portions of the State Farm, as cultivated under the direction of the Board the past season. It should also be understood by those members of the Board not already apprised of the fact, that the early frost and the drought, which did but little damage in most parts of the country, were somewhat severe at Westborough. This will account in part for the large proportion of imperfect corn mentioned in Mr. White's report.

Your Committee would further remark, that while they have confidence in his endeavors to do every thing in good time and in the best manner, yet such has been the pressure upon him for labor and superintendence in matters of permanent improvement, pertaining to the future benefit of the farm, that much of the oversight has been, necessarily, confided to others, and, therefore, their directions may not have been, in all cases, carried promptly into effect. The crops raised are numerous. A large amount of land has been cultivated, and it is known to all, that the labor has been performed, principally, by boys, (under the care of an officer,) all of whom are *entirely* unacquainted with farming business; therefore, some crops may have suffered by late and improper planting, and others from want of subsequent care, and we are of the opinion, also, that the application of the fertilizers, and the treatment of the crop, has not been such, in every case, as was intended by your Committee. Owing partly to causes already named, but more, perhaps, to others *yet inexplicable*, your Committee are free to say, that their expectations are not realized, and that these experiments must be prosecuted much further, to warrant the publication of experiments that shall be reliable as the basis of general cultivation.

The disparity of results obtained from different fertilizers, in some cases, is so great and so different from those generally realized, both in this country and in Europe, as to awaken an inquiry, whether there has not been some mistake in the experiment, and, therefore, how far reliance can be placed upon these fertilizers. For instance, last year, guano produced an extraordinary crop of potatoes, while this year, on the same land, and with the same treatment, the crop was inferior in quality, and much less in quantity. So with the super-phosphate of lime, the reputation of which is now established as a valuable fertilizer. In some instances, Mapes' had the advantage; in others De Burgs'; and while the soil and cultivation were the same, the effect was not uniform. Your Committee are unable

satisfactorily to account for some of these discrepancies, and therefore, recommend that the experiments be tried again upon the same soil. It will, however, be noticed in some of the crops, especially the carrot, that leached ashes, potash, guano, and the super-phosphate of lime were a cheap and an efficient manure, when compared with the barnyard compost.

The experience in relation to guano and the super-phosphate of lime, is so generally in their favor, as to attest to their value, not only as to their immediate but as to their permanent benefit. But your Committee are of opinion, that if these are applied in the hill, they should be previously compounded with muck or loam and thoroughly mixed with the soil, to prevent them from destroying the germ and tender root when the seed first vegetates.

All of which is respectfully submitted by

MARSHALL P. WILDER,
J. A. NASH, } *Committee.*

Farmer's Report of Crops on State Farm at Westborough, 1855.

PEAS.

One-fourth acre, sown April 6, and manured as follows :—

One-eighth acre, fifty pounds Mapes' super-phosphate of lime, applied in drill. Product, 8 bushels. One-half Washington and one-half Marrowfat.

One-eighth acre, fifty pounds De Burgs' super-phosphate of lime, applied as above. Product, $7\frac{1}{2}$ bushels. Same kind of peas.

POTATOES.

Chenangoes, one-half acre, planted April 27. Three-sixteenths acre manured with one hundred pounds Mapes' super-phosphate of lime. Product, 20 bushels, and of good quality ; or, $106\frac{2}{3}$ bushels to the acre.

Three-sixteenths acre, manured with one hundred pounds De Burgs' super-phosphate of lime. Product, $21\frac{1}{2}$ bushels, good quality ; or, $114\frac{2}{3}$ bushels per acre.

Two-sixteenths acre, manured with two hundred pounds Gould's muriate of lime, at half a cent per pound. Product, $9\frac{1}{2}$ bushels fair quality, or 76 bushels to the acre. All manure applied in the hill.

St. Helena potatoes, seven and one-fourth acres, on land hired of T. A. Smith. Product, 928 bushels.

[*Note by Committee.*—This land was divided into fifteen different lots for the purpose of making experiments with various fertilizers. These were so unsatisfactory, owing in part to the inequality of the soil, but more perhaps to the causes alluded to, that the Committee

have reserved the results for further consideration, with a view to a repetition of the same experiments, before the publication thereof.]

Potatoes planted on Fay Farm,

May 29, and manured with four hundred pounds guano per acre. Amount of land, one acre. Product, 137 bushels.

One-sixteenth acre, planted with seedlings from Rev. C. E. Goodrich. Manured with guano, twenty-five pounds. Product, 8 bushels; or, 128 bushels to the acre.

Peach Blow Potatoes planted on the Plain.

Three acres, manured with four hundred pounds of guano per acre. Planted June 5. Product, 404 bushels, or, 134⅔ bushels to the acre, quality good.

One and one-fourth acre, below farm house. Planted June 8. Manured with four hundred pounds guano per acre. Product, 119 bushels, small and not very good; or, 95⅕ bushels to the acre.

The latter piece was planted in 1854 with the same kind of potatoes, manured with guano in the same proportion, and produced 189½ bushels of very nice potatoes. Whole amount of potatoes raised this year, 1,647 bushels.

INDIAN CORN.

On the Plain.

Planted May 21 and 22, and manured in the hill as follows:—*On the east side, six acres.* 1*st acre*—twelve dollars worth of barn manure. Product, 99 bushels of ears—88 sound, and 11 soft corn. Weight of stover, 3,665 pounds. 2*d acre*—four hundred pounds guano, cost, twelve dollars. Product, 59 bushels of ears—38 sound, and 21 soft. Weight of stover, 1,900 pounds. 3*d acre*—one hundred and fifty pounds potash, composted with coal ashes, cost, twelve dollars. Product, 70 bushels of ears—58 sound, 12 soft. Weight of stover, 2,300. 4*th acre*—four hundred pounds Mapes' super-phosphate. Product, 86 bushels of ears—74 sound, 12 soft. Weight of stover, 2,360 pounds, cost, twelve dollars. 5*th acre*—four hundred pounds De Burgs' do., 72½ bushels of ears—59 sound, 13½ soft. Weight of stover, 2,280 pounds. 6*th acre*—ten barrels Gould's muriate of lime, cost, twelve dollars. Product, 65½ bushels of ears—48½ sound, 17 soft. Weight of stover, 2,320 pounds.

The corn on the five last mentioned acres did not come up well, and was planted over, some of it, three times. This, with the severe drought and early frost, will account for the small crop, and the large proportion of soft corn. All were manured at the same expense.

On the west side of the plain, five acres, manured with eight and one-

third cords barn manure per acre, spread broad cast and ploughed in. Product, 429½ bushels—392½ sound, 37 soft, or 85 9/10 bushels to the acre.

Also, *three acres on west side, north end*, manured with a compost of meadow muck, husks and lime, at an expense of twelve dollars per acre. Product, 258½ bushels—220 sound, 38½ soft, or 86⅙ bushels to the acre.

One acre on west side, in centre, manured with six dollars worth of barn manure, and three hundred pounds Mapes' super-phosphate. Product, 110 bushels—97 sound and very nice, 13 soft. Weight of stover, 4,470 pounds.

One acre on west side, in centre, manured with six dollars worth of barn manure, and three hundred pounds De Burgs' super-phosphate. Product, 108 bushels—96 sound and good, and 12 soft. Stover, 4,325 pounds. These two acres were side by side—barn manure ploughed in, and the super-phosphate mixed with loam before being used.

On Warren Lot.

One and three-fourths acre, planted May 31, with sweet, pop and early white corn. Manured from reservoir mixed with coal ashes and ploughed in. The institution received from this field eighteen dollars worth of green corn; also, 100 bushels were harvested.

Corn on Fay Farm.

The amount of land was by estimation six acres, and manured with the remnants of all the fertilizers used on the State farm, with the exception of one acre, which was manured with manure from the barnyard. The whole amount of corn on this piece was 470 bushels —400 sound, 70 soft, 78⅓ bushels of ears to the acre. This piece was greensward, and had been mown several years previous.

Note.—One half acre of the above piece was manured with two hundred pounds super-phosphate, Mapes', and produced 38 bushels good corn.

One-half acre by the side of the above was manured with two hundred pounds De Burgs' super-phosphate, and produced 43 bushels of good corn. The corn on these last two pieces ripened much earlier than any other in the field, and was decidedly the best.

Lastly. The acre and one-half planted for fodder produced a good crop.

ONIONS.

On Field No. 1, front of Piggery.

Five-eighths acre manured with six cords barn manure, and two hundred bushels leached ashes, worth thirteen cents per bushel,

ploughed in lightly, sown May 4, and produced 263 bushels, very nice; or, 421$\frac{3}{8}$ bushels per acre.

On Plain.

Five-eighths acre manured as above—sown May 12, and produced 198 bushels, good; or, 317 bushels to the acre.

CARROTS.

On Field No. 1, in Front of Piggery.

This field was divided into six strips, containing twenty-eight rods each.

Lot A.—Manured with ten dollars worth guano, and produced 4,070 pounds, or 81$\frac{2}{5}$ bushels.

Lot B.—Ten dollars worth Mapes' super-phosphate. Produced 3,200 pounds, or 64 bushels.

Lot C.—Ten dollars worth De Burgs' super-phosphate, and produced 3,485 pounds, or 69$\frac{7}{12}$ bushels.

Lot D.—Ten dollars worth potash, dissolved and mixed with coal ashes, and produced 4,160 pounds, or 83$\frac{1}{5}$ bushels.

Lot E.—Ten dollars worth leached ashes, at thirteen cents per bushel, and produced 4,370 pounds, or 87$\frac{2}{5}$ bushels.

Lot F.—Ten dollars worth piggery manure, and produced 2,690 pounds, or 53$\frac{4}{5}$ bushels.

The manure and the fertilizers were spread broadcast and ploughed to the depth of ten inches or more. The remainder of this bed was manured with eight and one-third cords of barn manure per acre, and produced 4,760 pounds, or 95$\frac{1}{5}$ bushels. The land in this last piece contained twenty-six rods.

This field of carrots was sown May 11, and they came up finely, but, as an experiment, were never thinned. The bed continued to look well until August, when they were checked in their growth by the drouth.

Carrots on the Plain (old bed) Four Acres.

Divided into four equal lots; previous crop for four years the same.

1st. On the west side manured with ten cords barn manure per acre, at a cost of thirty dollars. Product, 23,150 pounds, or 463 bushels.

2d. One hundred and fifty pounds of potash composted with coal ashes at an expense of twelve dollars. Product, 23,450 pounds, or 469 bushels.

3d. Four hundred pounds Mapes' super-phosphate, at an expense of twelve dollars. Product, 24,590 pounds, or 491$\frac{4}{5}$ bushels.

4th. Four hundred pounds De Burg's super-phosphate, at an expense of twelve dollars. Product, 25,630 pounds, or 512½ bushels.

These carrots were sown June 8 and 9. They were thinned to about the rate of nine to the foot. They grew from the first, rapidly, and at harvest produced an excellent crop of large, long, and sound carrots.

The whole amount of carrots raised the present year was 2,471 bushels, or, at 50 pounds per bushel, 61 tons, or 1,560 pounds.

BEETS.

In Front of Piggery.

Blood beets, 78 bushels; turnip beets, 66 bushels; mangel wurtzel, 87 bushels.

PARSNIPS.

In Front of Piggery.

93 bushels.

CABBAGES.

5,000 heads. On the whole, an inferior crop.

BEANS.

Two and a half acres, poor gravelly soil. Yield, 60½ bushels—quality good. Manured lightly with piggery manure.

TURNIPS.

Ruta Bagas, one and one-fourth acre on field No. 1, by piggery. Manured with eight and one-third cords piggery manure per acre. Yield, 668 bushels. Very nice and sound.

One-half acre above old reservoir, sown with Skirving's Swedish turnips. Yield, 186 bushels. Three cords barnyard manure. Turnips small but sound.

Turnips sown on early pea bed (purple top.) Yield, 39 bushels.

Eleven different varieties from the Patent Office were sown in August, on ground which produced rye this season. The yield was good, and some varieties were excellent. These will be reported on by the Secretary of the Board. The amount, 109¼ bushels. Land, about one-half acre.

OATS.

Three acres on Island, so called. Sown April 26, without manure and seeded to grass; yield, 72 bushels; very good quality. The grass on this piece looks well.

Two acres on field number two, north of the institution. Sown

April 27; three bushels of seed per acre, without manure, and seeded to grass; yield, 64 bushels; very nice. The grass appears finely.

Five acres on Warren lot. Sown May 2 and 3, without manure, with three bushels of seed per acre. This piece was also seeded to grass and looks equally well. Yield, 150 bushels; about one-twelfth wheat; very heavy and nice.

BROMUS.

One-half acre. Sown May 23. Manured from piggery at the usual rate—eight and one-third cords per acre. This was sown with oats, as directed by Mr. Benj. Willard, who sent the same here for experiment. The crop was good; the cattle loved the feed, and the fall feed on it was very abundant.

MILLET.

Three-fourths of an acre. Sown June 15, without manure. The crop was a fair one. A part was cut green for cows, and 1,500 pounds harvested as hay.

WINTER RYE.

Number of acres, 11.

On Sibley Lot—5 acres. This is the field on which the experiment with potatoes was made last year. The rye was sown after the potatoes were dug, and was, consequently, late. The crop was a light one; but the yield, per acre, was as follows: 1*st acre*—manured with barn manure last year; yield, 10 bushels. 2*d acre*,—manured with guano last year; yield, 8½ bushels; straw was light. 3*d acre*—Mapes' super-phosphate; yield, 12 bushels. 4*th acre*—De Burg's super-phosphate; yield, 11½ bushels. 5*th acre*—manured with super-phosphates, at half the expense of the other acres; yield, 8 bushels. Total amount of rye on this field, 50 bushels.

The six remaining acres of rye have not yet been threshed. The yield will not be less than 100 bushels.

The above acres were seeded to grass; but this was a failure in consequence of dry weather.

FRUIT.

10 bushels pears; 28 barrels apples.

The garden produced well; but the sales did not equal those of last year.

HAY.

On State Farm.

English hay, 34 tons; meadow hay, 22 tons; rowen, 3 tons.

On Fay Farm.

English hay, 34$\frac{4}{5}$ tons; 2d quality English hay, 4$\frac{1}{5}$ tons; meadow hay, 5 tons.

Total, English hay,	. . . .	76 tons.
do Meadow hay,	. . . .	27 do
		103 do

Corn fodder on State farm, 24 tons.

Corn fodder on Fay farm, 6 tons.

Note 1. In all cases the ploughing for roots was deep, probably averaging ten inches. For corn and potatoes, seven inches. For oats, from five to seven inches.

Note 2. The manure denominated barn manure, is made in the barn cellar, and is composed of manure from cattle, meadow muck and loam, about one-third each; the same proportions as used last season, 1854, and estimated at three dollars a cord of 102 bushels.

Note 3. The manure called piggery manure was made by swine at the new piggery. A large proportion of it was loam, and not as good as usual, from the fact that it was worked by the swine a less time than any previous year, and was constantly exposed to the weather, there being no piggery cellar.

Note 4. The sales from the garden were less this year than last by about two hundred dollars, for the reason that nearly two acres of land were improved by the State Reform School as a garden, and all varieties of vegetables raised, to a greater or less extent; and of course their demands on our garden were less.

Note 5. The Fay farm is the farm hired by the Board last spring, and lies west about three-fourths of a mile from the State farm. The crops raised upon it were hay, corn, potatoes and beans; and the income of the farm has yielded a profit.

Note 6. Whole amount of corn raised on State farm, 1,964 bushels of ears, or 982 bushels of corn.

Whole amount raised on Fay farm, 470 bushels of ears, or 235 bushels of corn.

Note 7. The carrots, as before stated, have all been accurately weighed, and fifty pounds have been allowed to the bushel; but if measured as farmers usually measure carrots, we should have 116 bushels for every 100 given. This fact is stated from actual trial.

Respectfully submitted,

S. N. White, *Head Farmer.*

For Messrs. Wilder and Nash,

Committee on Crops.

The degree of reliance upon experiments in agriculture, however carefully they may be conducted, cannot be exactly determined, on account of the peculiar nature of the experiments themselves, and the impossibility of arriving at a full knowledge of all the conditions which modify or influence them. In this respect, agriculture differs from most of the exact sciences, since every experiment made is subject to many sources of error, which the chemist in the laboratory, or the philosopher with his nicely adjusted apparatus, may guard against, but which are entirely beyond the control of the experimenter on the field. And hence, while these sources of error exist in all agricultural experiments, and while no human knowledge can entirely guard against them, the results of experiments tried, so far as known, under similar conditions, may be entirely opposite, and yet both may be correct,—some conditions and influences being hidden and wholly inexplicable.

This uncertainty and apparent contradiction attending experiments in farming has greatly discouraged many who entered upon them with enthusiasm, and who find that few farmers agree upon questions of vital importance to them.

In experiments with manures, for instance, no two results may wholly agree; but to conclude that they were not, on this account, of any value, would be premature and unjust. The conditions under which they were made may not be wholly understood, the soil or its preparation may differ, or the atmospheric influences, the climate or the exposure, may come in to modify or vitiate the result, or the previous cultivation and manuring of the soil may lead to a conclusion entirely unexpected. It is obviously necessary that all these conditions should be understood, and that the utmost care should be taken to learn and comprehend all others which may even remotely influence the result.

Many isolated experiments, made by individuals, are reported without sufficient detail to make them of any value in a scientific point of view. Moreover, the experiments most frequently made by the farmer are designed to show the effect of compound substances; and these experiments may be needed and answer a good purpose, as far as they go; but they throw no light upon the exact influence of each constituent of which the compost is made up. What is now wanted is to go behind and

beyond these, and to investigate each element and the influence it is capable of exerting upon the growth of plants, and to ascertain its money value from this influence; and until this end shall be accomplished we cannot arrive at the true economy of manuring, and agriculture must so far remain imperfect and empirical.

Some soils need the stimulus of ammonia for instance; others require the various phosphates. Guano is rich in these, and Peruvian guano is the cheapest form in which to purchase ammonia; but other substances are richer in the phosphates, and the end may be attained cheaper than by the use of guano.

The difficulties in the way of arriving at a real approximation to the value of each constituent of a manure are many and great; but they are such as will, in the course of time, be overcome; and when the exact value of each simple substance is established, we shall know better how to mix it with others so as to produce specific results, with some degree of certainty.

Something has, indeed, already been done, and inquiries in this most important department of farming,—the application of manures,—have assumed a more exact form, and are becoming more and more valuable. Scientific men in other departments, like that of astronomy, for instance, have greatly aided each other by associated effort, by means of which, observations made in one part of the world are speedily made known to all others. A like concert of action is needed among farmers, and particularly experimenters in agriculture, by means of which some greater uniformity might be obtained in the experiments. By this means, also, a greater division of the labors attending minute investigations would be attained, and greater accuracy and care secured. It has been justly remarked, that those who attempt to experiment often undertake too much, and thus render their results less valuable and reliable. Much may, and undoubtedly will be done, by farmers' clubs, and other associations, for this purpose.

The importance of making accurate meteorological observations in connection with all experiments in the field, is too obvious to need comment. Arrangements will be made hereafter to supply this want at the State Farm, and accurate observations, it is hoped, will throw light upon results, which, without them, might appear inexplicable.

Meantime similar observations are needed for the benefit of agriculture all over the country, and it is hoped that efforts will be made to establish a general system, from which might be expected the most valuable results. A plan for such observations was proposed by Lieut. Maury, of the National Observatory, in the August number of the American Farmer; and to give some encouragement to this project, the Board of Agriculture passed the following Resolution:—

Resolved, That this Board cordially approves of the plan proposed by Lieut. Maury, in the August number of the American Farmer, for extending to the land, for the benefit of Agriculture, the system of meteorological observations which has done so much for the improvement of navigation and commerce.

That we commend the plan to the favorable consideration of our brother farmers in other States, and request the members of congress from our own State to procure that degree of encouragement for agricultural and sanitary meteorology which has been so wisely and beneficially extended to the meteorology of the seas; and that the Secretary of this Board be, and he is hereby requested to forward a copy of this Resolution to each member of the congressional delegation from this State.

The plan proposed would secure a series of uniform observations all over the country, and there can be no doubt it would lead to the most valuable results. The association of a large number of observers could not fail to throw light on the climatic influences peculiar to every district, and thus many of the modifying circumstances attending experiments would be known from the highest and best authorities, while the mass of facts, transmitted to head-quarters, would be so generalized and distributed as to make the information on this subject accessible to all interested in it.

It has already been intimated that the experiments made at one place, and under the direction of one mind, may be of great value in themselves and for that particular locality; and yet, owing to difference in soils and meteorological influences, they may not be of equal value in other localities. In order to create some interest in the subject, and to elicit a general coöperation, so far as praticable, it was resolved, That the Secretary address a circular letter to the select-

men or overseers of the poor of every town in the Commonwealth, recommending that each town, possessing a town or poor farm, make the same, as far as possible, a model or experimental farm. This, it was thought, could be done at a very small expense, either under the direction of the selectmen or overseers of the poor, or by a committee which should be able to give it some personal attention, and continue in office long enough to bring out valuable practical results. This course of proceeding would also suggest many new ideas to a class of men not now interested in the subject, and bring much valuable information home to the very door of the farmer. At a subsequent meeting of the Board, the following was submitted as a circular letter embodying the recommendation of the foregoing Resolution.

BOARD OF AGRICULTURE,
Secretary's Office, Jan. 17, 1856.

Gentlemen :—At a meeting of the Board of Agriculture held at the State House on the 5th of December, 1855, it was voted, "That the Secretary address a circular letter to the selectmen of every town in the Commonwealth, recommending that each town possessing a town or poor farm, make the same, as far as possible, a model or experimental farm."

It must be evident to you that, owing to the difference of soils and the influences of climate in different parts of the State, no experiments made in any one locality, however carefully they may be conducted, can be of universal application or value. Hence, a model or experimental farm in any one part of the State, though it may be of importance and value in that vicinity, can hardly be expected to be of equal value in other sections. It is believed that many thousand dollars are annually lost by individuals, in the injudicious application of manures, and by the cultivation of crops of less value than others which might be adopted. By a course of judicious experiments, carefully conducted, on the town farms in every part of the State, many useful ideas might be suggested, without expense to the State or to the towns by which they were made; and these experiments would be brought from year to year to the knowledge of all who might wish to profit by them. These experiments might be intrusted to a committee specially appointed for the purpose, or to the selectmen, or the overseers of the poor.

I shall be happy to afford all the assistance in my power, by way of

suggestion or otherwise, to any towns by which this proposition shall be adopted, and to furnish to such committees having charge of the matter, the results of the experiments made on the State Farm at Westborough, as reported from year to year by the Board of Agriculture for distribution over the State; and I hereby request the selectmen of all towns where this course shall be pursued, or the committees so appointed, to notify me of the fact, when the reports of the Board of Agriculture will be forwarded to them.

Very cordially and truly,

Your obedient servant,

CHARLES L. FLINT,
Secretary of the Board of Agriculture.

To the Selectmen of the Town of ———.

It was also voted, that the Secretary be requested to invite such farmers in this Commonwealth as he may think proper, to furnish to this Board some information in regard to their method of feeding milch cows, stating, as far as may be, their age and weight, the expense of keeping, and the yield of milk for a given time; and also their method of feeding working oxen, the expense of the same, together with their weight, and the nature and extent of their work at the time; and the same with regard to horses. The difficulties attending experiments in feeding stock are greater than those in manures, for the reason that the modifying circumstances, and the conditions of the animal, vary, from causes not so fully understood; and researches in this direction, intricate as they are, require the utmost caution and the strictest care; and without it, they are comparatively worthless. Practical experiment, may, indeed, arrive at the comparative value of various articles of food, but it is of greater importance to settle a thousand other questions in the animal economy, such as the food best adapted for animals kept for specific purposes, like the production of milk, or labor, or beef; and the investigation involves a range of inquiries almost unlimited, and certainly beyond the means or the power of any individual effort. Associated effort, it is hoped, may do much, and the government should continue its exertions, as it proposes to do, till they result in something of permanent value to the farmer.

At the same meeting it was voted, that Messrs. French,

Brooks, Sprague, Lewis and Brown be a committee to consider and report to this Board what further measures, if any, are needed, to subserve the cause of agriculture in this Commonwealth; and at the annual meeting of the Board, held at the State House on the 16th of January, that committee submitted the following

REPORT:

Having given the subject their careful consideration, they are of the opinion that nothing would be better calculated to advance the cause of agriculture, and foster and direct the growing interest therein throughout the community at large, than the immediate establishment of an experimental farm, and as soon as the funds shall permit, of an agricultural school in connection therewith, where both the science and the practice of farming may be taught in all their departments.

Your committee do not propose to set forth in detail the many reasons which have led them to this conclusion; but they will be pardoned in suggesting one or two of the most important.

First. There is not at the present time, to the knowledge of your committee, any society or board existing in this Commonwealth authorized by act of the legislature to hold funds to be applied exclusively to the advancement of scientific and practical agriculture, or the diffusion of knowledge connected with rural economy.

Secondly. In the opinion of your committee, the time has arrived when the wants of the community demand something of this kind—a time when the learned professions seem to be more than full—when the attention of our citizens, and in particular of our young men, is being more than ever directed to the cultivation of the soil, and when many, both wealthy and liberal men in the Commonwealth, are holding out the inducement of an ample supply of funds in furtherance of such an undertaking.

Influenced by these considerations, among many others, your committee respectfully recommend that a committee be chosen by this Board to apply to the present legislature for an act authorizing the formation of a Board of Trustees, capable of holding funds to be applied in establishing an experimental farm and an agricultural school connected with it, designed to furnish instruction in every branch of rural economy, theoretical and practical.

B. V. French.
Seth Sprague.
John Brooks.

The Report was accepted, and thereupon a Committee was appointed, consisting of Messrs. French, Wilder, Sprague, Newell and the Secretary, to petition the Legislature to pass an Act incorporating a Board of Trustees, with authority to hold funds for the object specified.*

At the same meeting, a Committee, consisting of Messrs. Sprague, Brooks and Chandler, was appointed, to examine the premium lists of the several agricultural societies which receive the bounty of the Commonwealth, and to prepare a list of the premiums best calculated to promote and diffuse a knowledge of the science of agriculture to be recommended to the attention of the several societies, in the hope that it may aid in making a selection of the premiums to be offered by them.

The permanent improvement of land is, without doubt, the most important object to be aimed at in our agriculture; and the premiums of the societies, and the bounty of the Commonwealth should be so distributed as to encourage this improvement to the greatest possible extent. Unlike rewards for the production of a fancy article or a chance crop or animal, which happens to be remarkable without effort or care in breeding, every dollar offered for the encouragement of permanent improvements, whether in ordinary farm land or swamp or pasturage, or in the transplanting of ornamental trees, will produce a lasting beneficial effect on the whole aspect of the State, and will tend to elevate the general standard of our agriculture. On account of the very great importance of this subject I would respectfully call the attention of the officers of all agricultural societies in the State to this point particularly, and would suggest that it would be well to modify their premium lists wherever it is necessary for the purpose of turning the efforts of competitors more into this direction.

The aggregate amount awarded for farm management throughout the State for the past year was but thirty-seven dollars, for experiments in draining, but fifteen dollars, for reclaiming meadow and swamp lands, but one hundred and

* It should be stated that the Board of Agriculture is by law "empowered to take, hold in trust, and exercise control over any donations or bequests that may be made to them for promoting agricultural education, or the general interests of husbandry." They already hold property in their capacity as Trustees, which has been presented for specific objects.

forty-two dollars; while the amount awarded for excellence of root and grain crops, a large proportion of them accidental, being entered after it was discovered that an unusual yield might be expected, was over nine hundred and twenty dollars!

These facts show how little attention has been paid by farmers to the improvement of their land, and afford sufficient evidence that a stronger stimulus should be applied to accelerate progress in this direction. The offer of larger premiums to those who were most successful in this department would probably do more than any other one thing to produce the desired effect, and would thus contribute very much to promote the future prosperity of the Commonwealth.

The death of Doctor Harris having been announced to the Board, the following resolutions were unanimously passed:—

Resolved, That we deeply regret to learn the death of Dr. Thaddeus W. Harris, of Cambridge, and that we feel most sensibly the great obligations which rest upon the community to cherish his memory for his valuable contributions to the science of agriculture, in a branch of such immense importance to its interests, that of insect life in its relations to agriculture.

Resolved, That this Board sympathize deeply with the family of the deceased in their heavy bereavement, and that the Secretary be, and he is hereby requested to furnish to them a copy of these resolutions.

A Superintending Committee of the State Farm was elected, consisting of Messrs. Wilder, French, Newell, Brooks, Chandler, Sprague, Bartlett and Phillips, and it was voted that the employment of the boys of the State Reform School should be regulated by this Committee, acting in conjunction with a Committee appointed for the same purpose by the Trustees of that Institution.

At a meeting of this committee, held subsequently to the meeting of the Board, Messrs. Wilder and Bartlett were appointed a Committee on Crops, Fertilizers, &c.; Messrs. Brooks and Newell, a Committee on Stock; Messrs. French and Chandler, a Committee on Permanent Improvements; and Messrs. Sprague and Phillips, a Committee on Labor; and the code of By-Laws for the management and regulation of the farm

established by the Board and published in the Report of last year, was adopted by the Committee.

At the same meeting of the Board, a committee, consisting of Messrs. Newell, Phillips and Lewis, was appointed, to petition the Legislature for the usual appropriation for the current expenses of the farm for the ensuing year.

The preceding pages contain the principal doings of the Board for the last year. Much time has necessarily been devoted to the discussion of minute practical details, the result of which will be found, for the most part, in the statement of the management of the State Farm, as given above.

From various causes the labors and responsibilities of the Secretary's office have gradually and constantly increased, until they have become so great that very little time can be devoted to the studies and original investigations, which are so necessary, if any thing is to be added to what is already known in the science of agriculture. Perhaps this result might have been anticipated; but it is much to be regretted, since it interferes very materially with one of the objects sought to be attained by the establishment of the Board.

It has been my endeavor, heretofore,—and the plan thus far pursued has commended itself to the judgment of most sensible men,—to collect from different sources information which could not be reached by the great majority of farmers, but which would be useful to all; and to condense, arrange and generalize the facts obtained. Among other good effects expected from this mode of proceeding, it was thought something might thus be done to remove the impression now too prevalent, that farming does not offer so much hope of profit as some other pursuits not so attractive in themselves, and certainly not so important to the interests of mankind. With this view, a brief sketch of the origin, progress and present condition of agriculture in Massachusetts was given, in my first Annual Report, together with a complete discussion of the culture and profits of the cranberry. In my second Report, I attempted to give a brief summary of the facts now known in regard to the climate of New England, including many peculiarities in the agricultural meteorology of this State, and adding a complete discussion of the history, modes of cultivation and profits of the hop. This

crop has been found to be very lucrative in many sections, and many inquiries had been made in relation to it by practical cultivators in Massachusetts, who had no means of acquiring the information they desired on the subject. More than five thousand copies of the first of these Reports have been called for, and nearly as many of the second.

It must be obvious that original investigations, if they are to be of any practical value, should be subjected to the test of repeated and careful experiment before they are proposed as examples for imitation. Otherwise their publication would inevitably produce very injurious effects. False teachings are infinitely worse than none at all. To mislead the inquiring traveller will very often force him to retrace his weary steps with the loss of all his time and labor.

It has, therefore, seemed to be the most rational course to attend first to matters of immediate practical importance, leaving those which required more elaborate discussion for future consideration.

During the past year more than usual interest has been awakened upon different subjects connected with agriculture, by the offer of large and generous premiums by the Massachusetts Society for the Promotion of Agriculture, and much information has been elicited with regard to the practical use of farm implements, and particularly the mowing machine.

Probably the introduction of improved farm implements into general use would lend a more efficient aid to the progress of practical agriculture than all the books that could be written on farming. Books disseminate ideas. Implements successfully operated prove these ideas to be of practical value, thus preparing the minds of men to give a favorable reception to other ideas, when presented to them. Besides this, they are highly beneficial, both in their immediate effects and in the new ideas of improvement they suggest by their use.

The progress of agriculture may be measured by the increased call for new and better farm implements, as the advance of civilization in a community is shown by the greater demand for comforts and luxuries among its members.

There was a time in the history of American farming when labor was cheap, when strong limbs and the power of endurance were the only things sought for in the "hired man," and when

this labor was paid for chiefly as so much brute physical force. Intelligent labor, skill and thought found higher rewards in other callings, and the practical farmer was thought to be sufficiently well educated if he was able to hold plough, to mow, to sow and to reap. The labor, the physical force, necessary to carry on the operations of the farm, could be easily obtained in those days, and it was very natural that farmers should not then be able to see the need of any great variety of implements for the performance of their daily work.

But there is a very different state of things now. In many parts of the country it is very difficult to procure labor, and everywhere its price is far higher than it was even a few years ago. It is almost impossible to procure intelligent labor at any price. These facts have arrested the attention of farmers of all classes, and the prejudices in favor of established practices and old implements are fast giving way.

The highest mechanical skill is taxed to the utmost to supply the place of hand labor by machinery, and the time cannot be far distant when we shall avail ourselves of all the labor-saving implements now in use in other countries, with many of our own inventions, to meet the wants of American farmers. Efforts in this direction have already enabled the farmer to increase his crops very largely, while depending much less than formerly on manual labor. In the meantime farming has become more and more attractive to the young, and men of intelligence have turned their attention to it without fear of finding it a mere mechanical drudgery. They recognize it as a pursuit full of pleasure, and as opening a field for the exercise of the highest skill, where human genius has some of its grandest triumphs to achieve.

An examination of the improvements which have already been made in farm implements, and which have worked a complete revolution in agriculture, would obviously require far more space than I can devote to it. I must confine myself to the consideration of a few, as examples of the progress which has been made in this department of agriculture, dwelling especially on those implements to which the attention of the community has been particularly called.

Good ploughing may be called the basis of all good husbandry. The estimation in which the plough was held by

Cato, the distinguished Roman orator, politician and general, shows clearly the importance which was then attached to this implement, and the experience of all subsequent times has but confirmed the opinion of this old Roman. When asked "What is good tillage?" he replied, "to plough;" and to the question "what is the second point?" he replied again, "to plough,—the third is to manure." Undoubtedly, thorough, deep and careful ploughing has a greater influence on the crop of our New England farms than high manuring without good ploughing and careful preparation.

The plough has, therefore, been adopted as the emblem of agriculture, and to take a general "from the plough" and to say of a man, "he follows the plough," have been familiar expressions for the last two thousand years. When the attention of scientific men was first directed to the improvement of agriculture, Thomas Jefferson applied himself to the improvement of the American plough, and wrote an essay in which he calculated mathematically the exact form and size of the mould-board, and especially its curvature, with a view to lessen its friction.

In this way he rendered the most important services to agriculture, and he should have the credit of having been among the first in this country who attempted to give rules for the construction of this important implement in accordance with the exact principles of science.

It matters little to us what may have been the origin of the plough, and the discussion of its early history is foreign to my present purpose. It is sufficient to say that the earliest implement used for the purpose of turning up the earth was probably a pick, or a rough stick of wood resembling it in form, and the use of even this is said to have been suggested by the rooting of swine. Forms of the plough used in very early ages are preserved on ancient tombs in Egypt, on old Greek and Roman coins and sculptures, while the description of Hesiod, a thousand years before Christ, is so minute as to indicate to us the precise form then in use. Whoever has this form in his mind cannot fail to see its striking resemblance to a rude form of the pick, the handle being used as the beam, while a mere stick was often attached to the part of the plough corresponding to the top of the pick, to guide it.

Probably the plough has passed through more changes and transformations than any other implement of agriculture. In the earliest periods, as we have already seen, it was very rude and simple; and even in the most advanced periods of Roman agriculture, though there were ploughs of various models, with colters and without them, with wheels and without them, with mould-boards and without them, with broad-pointed shares and with narrow ones, ploughs adapted to light soils and ploughs adapted to stiff clays, the construction of the plough was comparatively rude and awkward, capable of doing little more than to scratch the surface of the soil. But the ploughs of all modern nations in which agriculture has made any substantial advance, are of a more complicated form and adapted to a greater variety of circumstances.

The Romans undoubtedly arrived at a tolerably correct idea of the form of the plough, that of a movable wedge; but they did not so clearly understand the combination of the principles of the wedge and the screw which modern ingenuity has applied to the mould-board.

The Dutch should have the credit of the earliest improvements of the plough of modern times. Early in the last century necessity led them to study the effects of draining on the soil, and the importance of a more thorough tillage became manifest. This led to successive improvements. About that time Dutch mechanics and engineers were considerably employed in England in the draining of large estates, and it is probable that this was the means of its introduction in England, where it was known under the name of the Rotheram plough. It was made entirely of wood, with the exception of the draught rods, the coulter and the share, and the iron with which the mould-board was shod. This plough, patented about 1730, was the starting point of our modern improvements. It came into pretty general use in England during the last century, though, being made in every county by the village blacksmith and wheelwright, it often assumed a great variety of forms. It was known even in this country under the name of the Dutch plough.

It would be useless to attempt even a sketch of the various forms through which the plough passed in England and Scotland during the last and the present century. The English

ploughs of the present day are, as a general thing, heavier than our own, but they move with steadiness and perform good work.

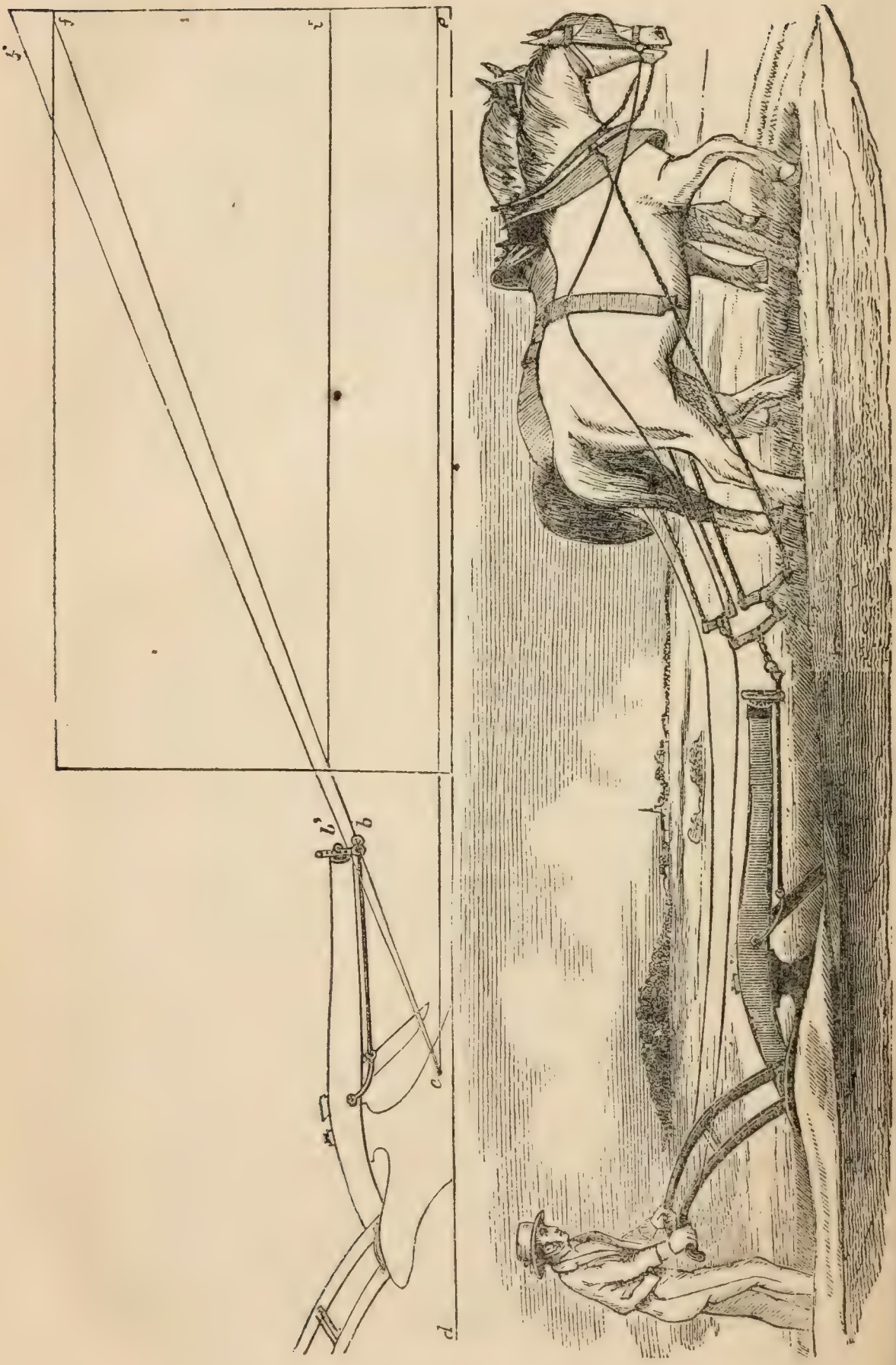
One of the most important properties of the plough is that of moving steadily through the soil, while it requires but little muscular action on the part of the ploughman; and these objects have been attained in many of the modern ploughs, both of English and American construction, but not without great difficulty, much study and practical experiment. With the most perfect construction much must, of course, depend on the mode of attaching the power, the length of the chain, &c.

The following judicious remarks on the draught of the plough, together with the cut to which they refer, from the illustrated catalogue of the enterprising firm of Ruggles, Nourse, Mason & Co., will give an idea of the care needed in adjusting the power:—

"From the complicated structure of the plough, and the manner in which circumstances oblige us to apply the draught to the implement, some misconceptions have arisen as to the true operation of the draught, and the proper manner of its application. Too little is understood of the true principles of draught, to enable the ploughman to attach his team and arrange the clevis so that the plough will do its work properly, and with the least force or power. To render this subject intelligible to every mind, the following remarks are made in connection with the plate annexed:—

"Let *b* represent the forward end of the beam, and *c* the centre of resistance on the plough, which may be assumed at two inches above the plane of the base of the plough, *d e*, though it is liable to constant changes, from the depth of the furrows, and constant inequalities in the soil.

"We have first to consider the particular form of those parts through which the motive power is brought to bear upon the plough. It is evident that the motive force acts in a direct line from the hook or ring at the shoulder of the animal, to the centre of resistance, and were it not for considerations of convenience, a straight bar or beam lying in the direction *c b*, and attached firmly to the body at *c*, would answer all the purposes of draught perhaps better than the present beam. But the draught not being the end in view, but merely the means by which the end is accomplished, the former is made to subserve the latter; and as the beam, if placed in the direct line *c* to *b*, would obstruct the proper working of the plough, we are constrained


b'
b
c
d

to resort to an indirect action to arrive at the desired effect. This indirect action is accomplished through the medium of an angular frame-work, consisting of the beam and the body of the plough, so strongly connected together as to form an unyielding structure. The effect of the motive force applied to the frame-work at the point *b*, and in the line of *b* to *f*, produces the same results as if *c b* were firmly connected by a bar in the position of the line *c* to *b*, or as if that bar alone were employed.

"The average length of the trace chains being 10 feet, including all that intervenes between the clevis of the plow at *b*, and the horse's shoulders, let that distance be set off in the direction *b* to *f;* and the average height at the horse's shoulders where the chains are attached, being about 4 feet 2 inches, let the point *f* be fixed at that height above the base-line *d c*. Draw the line from *f* to *c*, which is the direction of the line of draught acting upon the assumed centre of resistance, *c;* and if the plough is in proper trim, it will coincide also with the ring of the clevis; *e c f* being the angle draught, and equal to 20°. It will be readily perceived, that with the same length of hames, the angle *e c f* is invariable; and if the plough has a tendency to rise at the heel, or run on the point, under this arrangement, it indicates that the ring at *b* is too high in the clevis. Shifting the ring one or more holes downward, will bring the plough to work evenly upon the base of the landside, or work flat.

"If the plough has a tendency to rise at the point of the share, the ring *b* is too low, and must be moved by raising it one or more holes in the clevis. If a pair of taller horses be harnessed to the plough, the draught chains, depth of furrow, and soil (and, by consequence, the point of resistance *c*,) remaining the same, we should have the point *f* raised, suppose to *f'*; by drawing the line *f'* to *c*, we have *e c f'* as the angle of draught, which will now be 22°, and the ring will be found to be below the line of draft *f' c;* and if the draft chains were applied at *b*, in the direction *f'* b, the plough would have a tendency to rise at the point of the share, by the action of that law of forces which obliges the line of draught to coincide with the line which passes through or to the centre of resistance; hence the ring *b* would be found to rise to *b'*, which would raise the point of the share out of its proper direction. To rectify this, the ring must be raised in the clevis by a space equalling that between *b* and *b'*, causing it to coincide with the true line of draught, which would again bring the plough to work evenly on the base of the landside, and run flat.

"The foregoing principles are substantially such as are adopted by the most experienced ploughmen, and if properly applied, will not

only do the best work, but accomplish it with the greatest ease to themselves and their team. If the power (or team) is not rightly applied, good work cannot easily be done; for if the plough inclines in or out of the ground too much, or takes too wide or too narrow a furrow-slice, the ploughman must exert force to direct it properly, in addition to that required to overcome the obstacles and inequalities in the soil; but if the power be rightly applied, the plough will move so accurately as not only to perform good work with more ease to both ploughman and team, but in soils free from obstruction, even without being guided.

"To effect a proper horizontal movement, the clevis at *b* or draught-rod (if one is used instead of a clevis) must be adjusted and confined at that point, moving it to the right or left, if necessary. This will cause the plough to take the proper width of furrow-slice, which, in sod, should be wider or narrower according to the depth of furrow, or rather the thickness of the furrow-slice required; for as the thickness is increased, so also must be the width, in order to turn it easily and perfectly over, particularly when the furrow slices are required to be laid over level and side by side. The proportion in ordinary sod should be 6 by 11, 7 by 12, or 8 by 14 inches. In determining the width of furrow-slice, some regard must be had to the strength of the particular sod to be turned; for the plough will turn over a wider slice in a strong or stiff sod than when running in one more easily broken, or it will cripple and double when raised to a perpendicular position, thus only doing the work called "cut and cover." When the slices are required to be laid at an angle, and lapped each one upon the preceding, the proportion of width should be less, or about 6 by 9 and 10 or 7 by 10 and 11 inches; for the narrower the slice in proportion to the depth, the greater will be the inclination of the slice as it is lapped upon the preceding one."

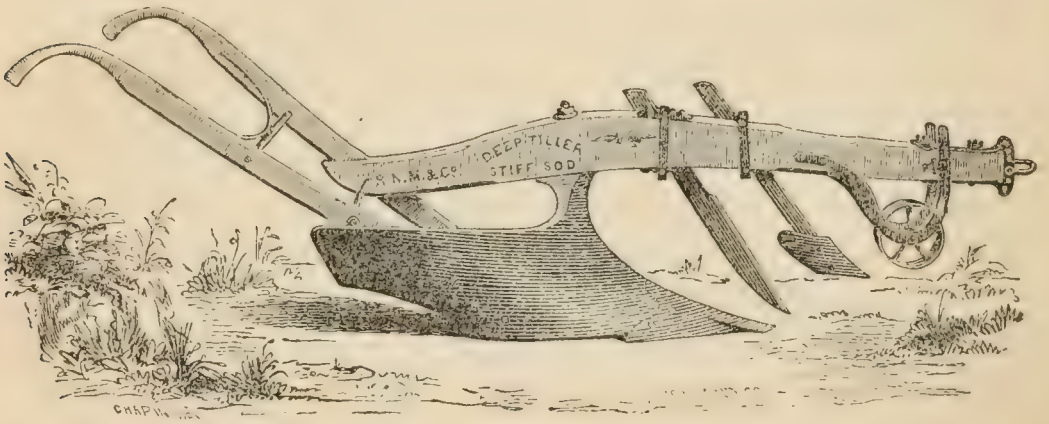
By far the larger part of the draught of the plough, or strength of the team required, is due to the friction in the soil, while the cutting, raising and turning over of the turf adds comparatively little to it, although, it is true, the friction is somewhat increased by the weight of the plough, and this weight is of course increased by the weight of the furrow-slice as it is lifted from its bed. Hence the draught of the plough is but slightly increased by an increase of speed, since the friction is not increased, but remains nearly the same, on the bottom of the furrow, on the landside and between the furrow-slice and the mould-board, whether the motion be fast or slow.

Modern improvements have aimed, therefore, to overcome the friction and resistance by an improved construct ofion the mould-board, and by the use of better materials; and it is well settled by practical experiment that the draught depends less on the weight of the plough itself than on its construction. The draught does not increase in proportion to an increase of weight, and hence, though some object to the modern ploughs as compared with the models in use fifty years ago, that they are heavier, it is a common remark that their draught is easier and they require less strength of team.

The ploughs in use in this country a century ago were not very unlike those used by the old Romans before the Christian era, and by some of the nations of Southern Europe at the present day. The most common model was that designated as the "bull" or the "hog plough," on account, probably, of its propensity to root in and out of the ground. The ploughs used here, even after the beginning of the present century, were made of wood, except the coulter and the share, which had been made of iron, even before the landing of the pilgrims.

These were constructed awkwardly enough; but the form of the mould-board was especially defective, and great strength of team was necessary to accomplish very indifferent work. It was undoubtedly suitable for working in some soils, as very light sandy plains, for instance, and if its draught had been easier, it might have been considered a decided improvement on older models. But the mould-board and the share were so attached as to make the wedge too blunt, which, of course, made the friction excessive. It broke and crumbled the furrow-slice, it is true, in places, and was not calculated to turn a flat furrow. So far its work was very well, though neither of the extremes is always desirable. But the action of the old plough was not uniform, some furrows being set too much on the edge, while others were laid quite flat. It was, as a general thing, lighter than the ploughs now used; but its construction not being based on such principles as to make it of easy draught, it was more difficult to hold, more easily thrown out of the ground, and therefore required constant watchfulness on the part of the ploughman. It was difficult to cultivate to any considerable depth without the assistance of one or two men to ride on the beam to "hold down." The mould-board

was generally shod with iron to diminish the friction and prevent wear; but frequently only strips of iron, in small pieces, old horse-shoes, &c., were used for the purpose, and the desired effect was not produced. It is not too much to say that the changes and modifications made in the mould-board within the last forty years have effected such improvements as to enable the farmer to do a much greater amount of better work, with far less expenditure of strength, and to reap larger crops as the result, while the original cost of the implement is less than it formerly was. The saving to the country from these improvements alone, within the last twenty-five years, has been estimated at no less than ten millions of dollars a year in the work of teams, and one million in the price of ploughs, while the aggregate of the crops is supposed to have been increased by many millions of bushels.



These improvements in the form of the mould-board will be plain, when we consider that one side of the furrow-slice, as soon as it is cut, begins to rise gradually, till, as the plough advances, it is turned entirely over. The mould-board should, of course, be so constructed as to offer the least possible resistance as it advances, and to run as far as possible without clogging, to which the old plough was especially liable, the lines of the mould-board being concave, instead of convex or straight, after the rules more recently laid down requiring the "board to be composed of straight lines in the direction of its length, with continually increasing angles to the line of the furrow; and these last lines are severally straight, convex and concave." And Ransome, after the most mature study of this implement,

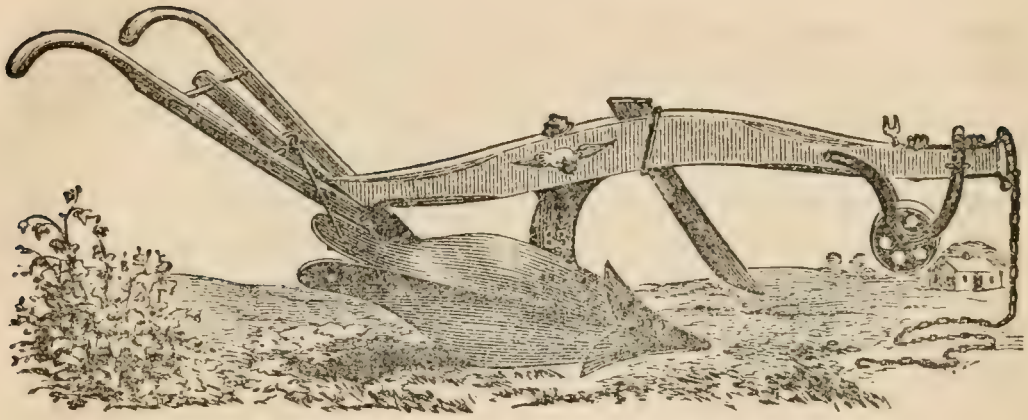
says: "Although no one form of mould-board will or can be applicable to every variety of soil and circumstance, there is no description of soil for which a perfect mould-board may not be made by this rule in some of its modifications."

The first patent for a cast-iron plough in this country is believed to have been that of Newbold, in 1797, and so far improved was the model of this first cast-iron plough, that Peacock, in his patent of 1807, paid the original inventor of the plough of 1797 the sum of $500 for the privilege of copying some parts of it.

Cast-iron ploughs had been previously manufactured in Scotland by James Small, who established a manufactory in 1763. It was a fortunate coincidence that the founding of cast-iron was introduced about the same time, and it occurred to him to make patterns of the principal parts of the plough, the mould-board, the sole and landside, in order that precise duplicates might be multiplied to any extent. Hence arose the cast-iron plough, now in general use in Great Britain; but whether the American inventor had a knowledge of the existence of these ploughs is not now known.

The state of agriculture at the beginning of the present century was such that the successive changes and improvements, both in Great Britain and in this country, were not adopted by the great mass of farmers. Their introduction was, of course, far slower than that of any improved implement would be at the present time, though the prejudice against the use of new articles is not yet wholly removed. But though the prejudice against the cast-iron plough, both in this country and elsewhere, was at first very strong, they gradually gained the good will of practical farmers, till they entirely supplanted the old wooden models.

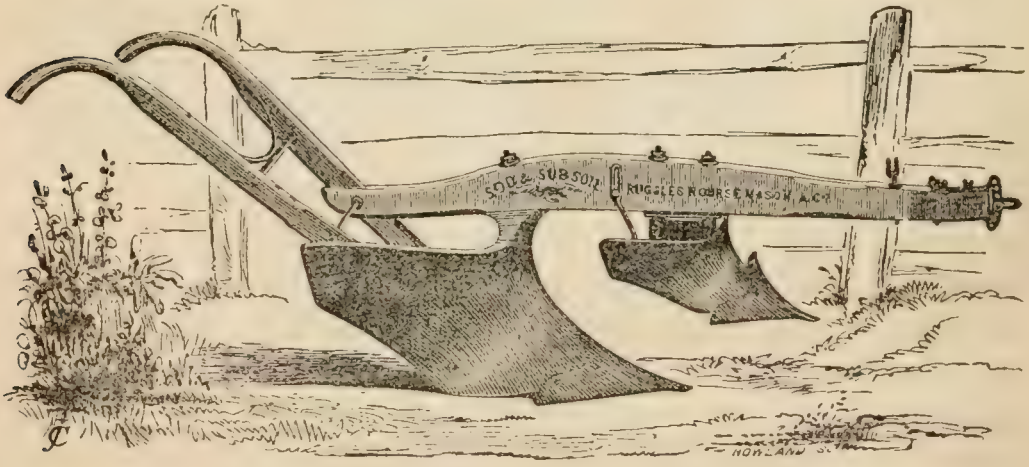
Among the innumerable modifications of the plough in modern times, that known as the side-hill plough was of a very early date, among the earliest of modern improvements, in fact, and it has still held its ground after undergoing many successive changes, till it has assumed the following form, called the swivel, and numbered 83, in the catalogue referred to.



It has two mould-boards in one, and is admirably adapted to hill-side ploughing, saving also the "dead furrow," when used on level.

A hook, fastened to a centre piece between the handles so formed as to change to either side of the beam, enters the back of the mould-board and keeps it steady, whichever side it may be wanted. The mould-board is easily turned while the team is turning at the ends of the furrow.

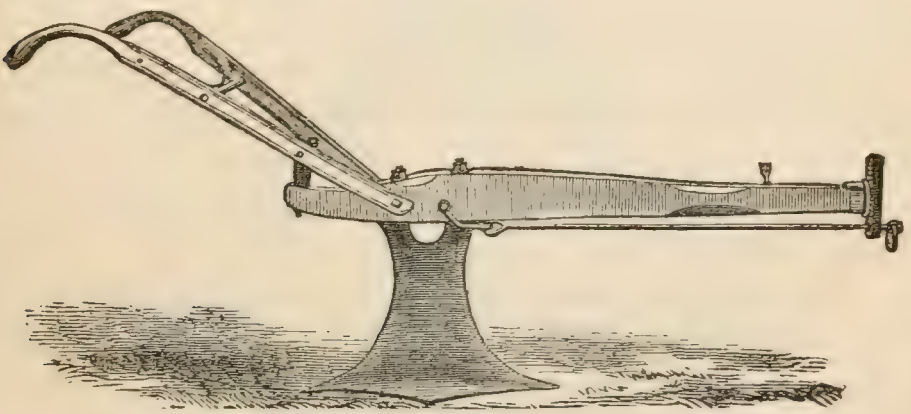
Another modification of the plough of modern times is that of the Michigan, or double mould-board.



"The forward mould-board is connected with the beam, and its depth of furrow is adjusted as follows: A substantial iron flange is fastened to the under side of the plough-beam by two bolts passing up through the flange and the beam, and made tight on top by nuts and screws; the flange has two rows of slots in it to receive the bolts from the landside of the forward plough, and the bolts make the plough entirely and substantially fast to the flange, when their nuts are tightened; and by means of the slots in the flange, the forward

plough is raised or lowered, and made perfectly fast and secure at any point wanted for the regulation of its depth of furrow, and any requisite depth may thus be secured to any degree of nicety. The forward mould-board turns the sod-furrow as wide as the working of the whole plough, and the earth on top assuming an arch-like shape, is naturally opened, while the effort of the rear mould-board brings up the deeper soil, completely covering and filling the surface, so that the sod-furrow is in no case liable to be brought to the surface by harrowing or other processes of after-cultivation; the surface of the furrows lies arching, the cohesion of the soil is neutralized, its integral parts are disunited, and the ploughed land lies light and mellow, and almost as fine as if harrowed,—indeed, in some free soils rendering the use of the harrow quite unnecessary."

Another modification is that of the subsoil plough, designed to loosen the lower strata of the soil without bringing it to the surface. Of this plough there are numerous sub-varieties, and among them the following—



having a diamond-shaped foot attached by a cast-iron plate to the ordinary plough beam. The soil is lifted up and loosened. The use of the subsoil plough is admirably adapted to underdrained lands.

In one point, especially, we have improved—the adaptation of our ploughs to the different kinds of soil on which they are to be used. When attention was first directed to this implement during the latter part of the last century, the principles of ploughing were not so well understood as at the present day. The work was not so carefully done or so critically examined, and consequently the want of different forms of the plough was not much felt. But now the ground must be more skilfully prepared for cultivation; soils of different natures are differently

treated, and every farmer sees that he cannot use the same instrument to produce directly opposite effects. Hence the great variety of ploughs we now see in every agricultural warehouse.

As to the manufacture of the plough, the custom has as greatly changed as the form of the implement itself; for while a half century ago it was made by the blacksmith and in a great many places in all parts of the State, it is now made in large establishments by those who devote themselves to the business, and these establishments have gradually diminished in number, while the whole number of ploughs manufactured has greatly increased. Even so recently as 1845 there were no less than seventy-three plough manufactories in the State, making annually 61,334 ploughs *and other agricultural implements*, while now there are but twenty-two plough manufactories, making 152,686 ploughs, valued at $707,175.86. So great indeed has been the interest taken in the improvement of this implement, that up to last year no less than 372 patents had been granted by the government for different forms of it.

But we have not yet reached perfection, and very much still remains to be done to lighten the draught, and thus to enable the farmer to accomplish the same or a greater amount of work with less expenditure of animal power and muscular force.

Experiments are now in progress by which it is thought the work of a thorough pulverization of the soil will be effected with greater economy of time and strength; and though all changes are not substantial improvements, still we should remember that we have not reached the height of perfection, that it was only by repeated and long-continued study and experiment that past improvements have been made, and also that it is by these means alone that we can hope to progress, or to perfect this most important implement of agriculture.

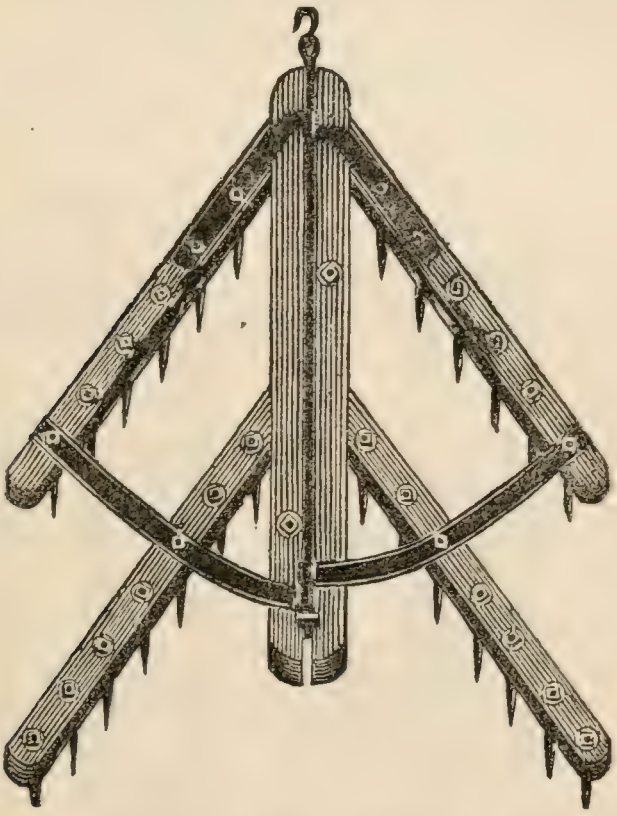
The harrow naturally follows the plough, for the purpose of effecting a more complete and perfect pulverization of the soil. It has undergone less changes and modifications than most other farm implements; and most forms of the modern harrow bear some resemblance to those of the ancients, as illustrated on medals and sculptures. It is a simple implement, but scarcely less important than the plough itself.

The old harrow was constructed of wood, of simple bars and cross-bars furnished with teeth. More recently the material

used is of iron, with teeth usually pointed with steel. The harrow is often objected to on account of its great weight, requiring too slow a motion of the team.

A light, sharp-toothed harrow, moved quickly over the ground, accomplishes far the best work in preparing the ground for seed. So important is it that this implement should be rapidly moved, that the work of the same implement, drawn sluggishly over the ground or moved more rapidly, differs very widely. It is true that a certain amount of weight is very important, and this weight differs according to circumstances; yet it is desirable to have it in the most compact form.

The following illustration of the Geddes harrow will serve to show one of the modern modifications of this implement. The

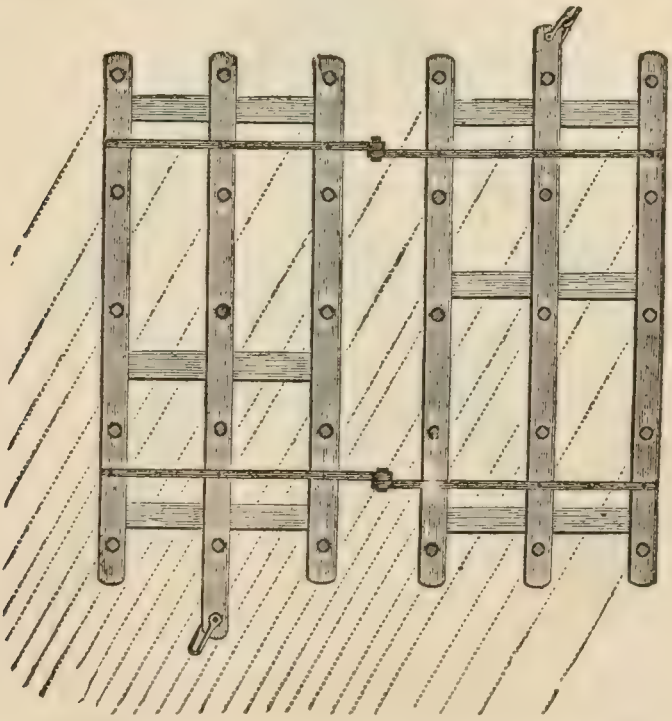


Geddes harrow consists of two pieces of frame-work, hinged together in the centre, so that either side may be conveniently elevated to free it from stones, sods, &c., while the harrow is moving, and without disturbing the operation of the other half. One part may be folded upon the other, in passing stones, between stumps, fruit trees, &c. The arrangement of the teeth in the frame is such, that each tooth operates distinctly from the others, and the number of impressions made on the soil

will be equal to the number of teeth. The teeth are made of the best Swdes' iron, steel pointed. The harrows are of various sizes and weights, containing 14, 18, 22, 26 and 30 teeth.

Another form of the harrow is represented in the rhomboidal or hinged harrow. The rhomboidal form is one of the few instances of improvement on the principles adopted by the ancients for the manufacture of this implement.

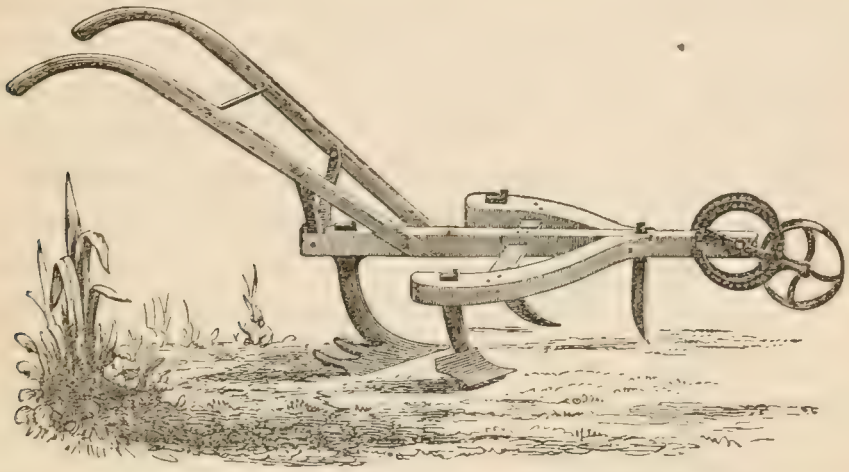
It consists of two pieces of frame-work, connected by iron hinges like barn-door hinges, which are bolted to each bar, thus greatly strengthening the harrow. The harrow may be folded or separated for the convenience of transportation or other purpose. Either half may be lifted while the implement is in motion. There are thirty teeth in the harrow, so that while from their number and arrangement the ground is worked fine, they are not liable to clog. This harrow is made heavy for rough land and the pulverizing of sod furrows, or light for grain and grass seed.



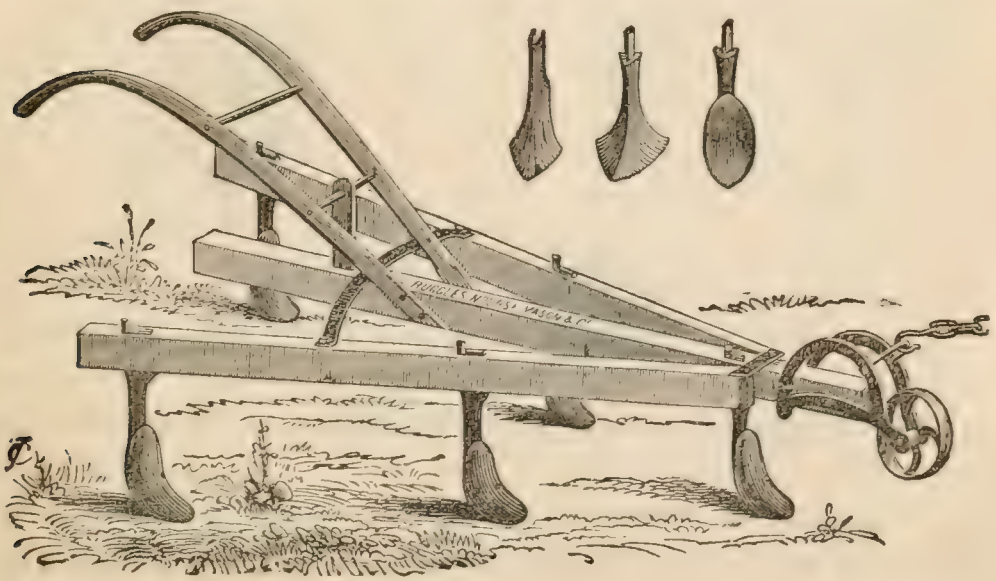
But a large class of implements of modern construction combine, to some extent, the action of the plough and the harrow, and are found to be of essential assistance in agriculture. Among these are the grubbers, the horse-hoes, the cultivators, and other implements of a like character.

The horse-hoe is a valuable labor-saving implement, used for

stirring the soil, and hoeing and cultivating corn and root crops. It was first invented by the celebrated Jethro Tull, and gave its name to his system of husbandry for many years.

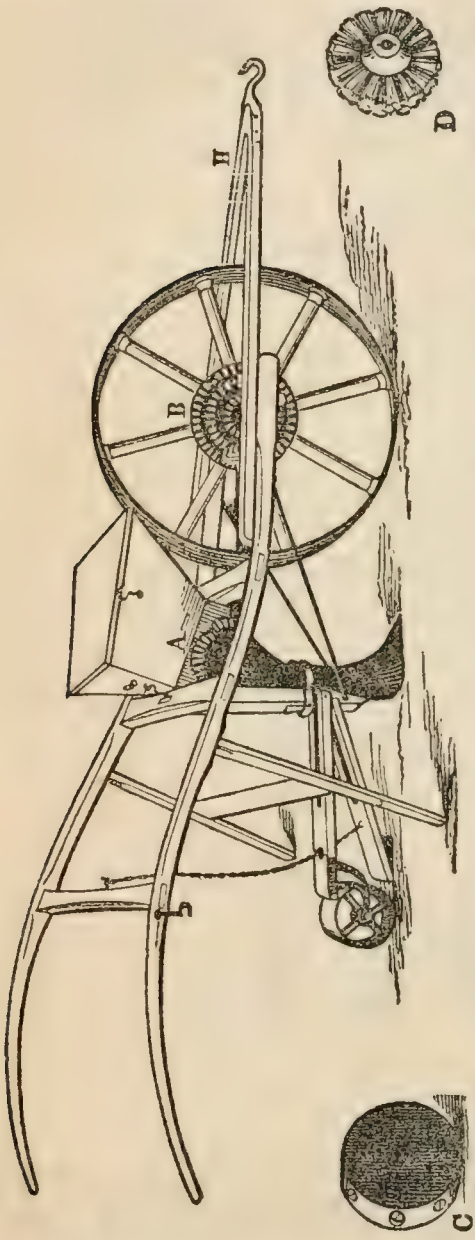


This implement is of very easy draught, and is vastly superior to the hand-hoe in point of economy of time, while it accomplishes admirable work. The varieties of this implement, since its first rude form, have been innumerable. In the form represented above the forward tooth acts as a colter to steady the implement, while the two side teeth are made in the shape of the mould-board of the plough, capable of being changed so as to throw the soil from the rows or towards them, while the broad tooth follows between the two, cutting up weeds and grass and loosening the soil. This invaluable implement will be found, when understood and properly used, to save much labor at a season when the farmer's work is often hurried.



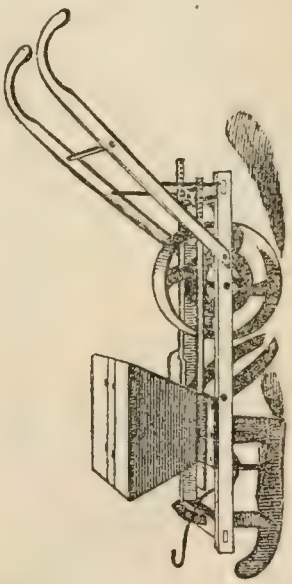
The teeth of the cultivator are sometimes made reversable, as in the foregoing plate, so that when one end of the shares becomes worn and useless, it may be changed, and the other end put in its place.

Many other small implements are invaluable as labor-saving machines, and deserve mention, did space permit. Among the most important of these are, perhaps, the seed sowers. These are of various modifications, each accomplishing its work more or less perfectly. The annexed plate represents the form and structure of Emery's Seed Sower.



It is adapted to sowing in drills or in hills, and is geared so as to drop large or small seeds at pleasure.

Billings' Corn Planter, as illustrated in the following cut, is admirably adapted for planting



corn, beans and other crops, saving a vast amount of labor and time.

Most of the implements of this description are of easy draught.

The hay crop of the country cannot be estimated at less than a hundred millions of dollars a year. It must be gathered at

a season when labor is to be obtained with difficulty, and at even higher than the usual high wages, and when the weather is often fickle and precarious, generally oppressively hot, making the task doubly irksome and unhealthy. But, besides this, many acres of grass on our ordinary farms ripen at about the same time, which, if allowed to stand too long, will decrease in quantity and value of hay which might otherwise have been made from it. This last consideration I regard as one of the strongest reasons for availing ourselves of the use of the mowing machine, by which it can be secured and saved most quickly, easily and cheaply.

Mowing is, at best, one of the severest labors on the farm, notwithstanding the efforts of poets and other writers to make people believe it is all fun. It calls into play nearly every voluntary muscle in the body, requiring not only the more frequent and regular movements of these muscles, but, on account of the twisting motion of the body, an unusually great exertion of muscular power. Nor does it require any small amount of skill to become a good mower, since it is proverbial that, unless the boy becomes accustomed to the scythe and learns while young, he can never become a skilful mower. That the ingenuity of man should have been turned into this direction, therefore, and studied to shorten and lighten this severe operation, is not at all strange. That it should not have been done before, should, perhaps, rather excite our surprise. The reaper has been known and used on a limited scale for half a century; and as the process of mowing by machinery is not wholly unlike that of reaping, the one would seem to have been naturally suggested by the other.

The first mowing machine which met with any success in this country is believed to be that of William Manning, of New Jersey, patented in 1831, and which met with a limited success more than twenty years ago. This machine was furnished with the serrated or saw-tooth knife, having a vibratory motion.

In 1834 appeared the Ambler patent, simple in its construction, with a cutter bar of wrought iron, and a single smooth-edged knife, operated by means of a crank, which gave it the vibratory motion. It was used to considerable extent in 1835 and 1836.

Another machine was used to some extent in 1835, by which

the cutting was performed by circular knives, fastened on the periphery of a horizontal wheel, five feet in diameter. The wheel was suspended on a perpendicular iron shaft which hung on a lever, by means of which the driver could elevate or lower the knives at will. The motion was given by gearing connected with the wheels on which the machine rested. It was operated by two horses, and was capable of mowing ten acres a day.

Wilson's machine was very successful in experiments made in 1837. It could be operated by one horse walking behind the machine. The grass was so left as not to need spreading.

Another horse-mowing machine, that of Huzza, of Cincinnati, met with a limited success as early as 1836.

But it was not till a very recent date that the machine was constructed in a manner to give confident hope of its ultimate and perfect success.

The experiments made with mowing machines have at least demonstrated, beyond a doubt, that grass can be cut quickly and economically by horse or ox power, and the objections which are most commonly made to them are such as can easily be obviated by a more perfect manufacture, and by more skill on the part of the operator. It is, indeed, a mortifying fact, that they have been, in many cases, very imperfectly made, and the fact that many now in use have so often got out of order has thrown doubts upon their utility as a whole, and retarded their introduction very greatly. But this difficulty does not arise from any defect in the principle of the machine, and many failures, no doubt, are to be ascribed mainly to the impatience or stupidity of the operator.

It is not unfrequently the case that a man purchases a new machine or borrows one, and on starting off without sufficient care, finds himself brought to a stand with, perhaps, a broken machine, and instead of seeking the cause and repairing the damage, and starting anew, throws it aside as entirely worthless, and condemns the implement at once. Some of our most useful and now familiar farm implements have been repeatedly thrown aside at first by the fault mainly of the operator. A machine ought not to be condemned till after a complete and full trial. But enough of these machines have succeeded to the perfect satisfaction of the community to show that whatever

defects some of them may have, they may be made to accomplish the work for which they were intended.

Manufacturers have received a lesson, on the mowing machine, which, it is hoped, will be of some service to them. But the manufacturer is not alone to blame, as a general thing, for the defects of an implement to be used on the farm. The farmer too often prefers a machine which is least expensive, and no matter how well it is made, he will insist upon having it at the lowest possible price at which it can be afforded. Manufacturers are therefore compelled to slight the work in order to meet the wants of the people, and cheaply-made articles alone can be sold cheap enough to suit the wishes of the buyer. In this way both the manufacturer and the farmer suffer. It is poor economy, as a general rule, to buy cheap articles.

As to the comparative economy of the use of the machine and hand labor on small farms, such as are most frequently found in New England, it seems to me the experiments of the past season in Massachusetts have fully decided the question in favor of the former. On this point, however, the opinions of practical men will be found to differ to some extent, though the weight of the testimony of those who have had any actual experience with the machine will be found to be in its favor. And this is especially the case of those who have been fortunate in obtaining a machine properly constructed and put together. In order to arrive at the conclusions of men of experience, the following circular letter was addressed to many individuals in different parts of the State, most of whom have very kindly furnished me with the results of their labors.

BOARD OF AGRICULTURE,
Secretary's Office, Boston, Dec. 22, 1855.

Dear Sir :—Will you oblige me by stating, at your earliest convenience, the result of your experience in the use of the mowing machine, especially as to the comparative economy of its use and the common scythe. How much is, or can be saved to the farmer, by using the machine instead of hand labor, on our ordinary farms? How heavy should you say the horses should be to work the machine most easily under all circumstances? Is the labor for ordinary horses more severe on a good machine than on the plough? How many hours a day would it be judicious or prudent to work the team on the machine, and at what speed? Do you consider the machine when well made,

after the best methods now known, as pretty free from faults? Have you tried to use oxen on the machine, and do you consider it practicable to work them? If they should be found to work well, which should you consider it the best economy to use, oxen or horses? What is the comparative cost of keeping oxen and horses in your neighborhood? Are the machines now used so simply constructed as to be easily understood by one who is beginning to use them; or, in other words, what amount of practice does it require to use them properly and easily? What suggestions can you make for one just beginning to use a mowing machine? With your knowledge and experience of its use, would you advise the farmer to buy and use a machine instead of cutting his grass with a scythe?

Will you oblige me by answering these queries as fully as possible, at your earliest convenience?

Very cordially and truly, your obedient servant,

CHARLES L. FLINT,

Secretary of the Board of Agriculture.

It may be proper in this connection, and before proceeding to quote from the many letters which have been received on this subject, to disclaim all partiality or bias in favor of either of the patents which are so frequently alluded to hereafter, and to state that it has been my earnest desire to arrive at the truth, as expressed in the collected judgment of those who have had the most practice and experience in the use of this important implement, and to aid the farmer in arriving at his own intelligent conclusions. Either of the patents which have been most used in this State, will, undoubtedly, if properly made, accomplish the work for which it was intended, and it may be true that each possesses advantages and defects peculiar to itself, which cannot be concealed by the owners or manufacturers themselves, who understand them best.

Among the letters by which I have been favored, is one by Samuel Parsons & Sons, of Northampton, who have probably had more experience than most men in the practical working of the mower. In reply to the questions contained in the above circular, they state:—

"As to the economy of its use in our vicinity we have no hesitation in saying, that one-half of the expense is saved in using the machine to cut and spread grass, when compared with the common scythe, to

say nothing of having it done when the weather is good and the grass in its proper state, whether in blossom or gone to seed, as the owner prefers. The horses that we have used from the first weigh from ten to eleven hundred each. We believe horses of the above weight the best adapted to all farm work, and of course, best for mowing, carting, ploughing, &c. Were the team for mowing and nothing else, we should have no objection to their weighing more than the above, provided they were smart and active; but a slow, logy team is not the thing, for it needs prompt action to start off in good shape and to work well.

"We consider the draught not heavier than that of the common plough. Were it used at the same time of the year, our opinion is that the team would chafe and sweat quite as much. A man on his own farm would have no occasion to work his team so as to injure it in the least, for the reason that he could mow more in the first half of the day than he could secure in the afternoon of the same, or the next day, with the same team. The past season we have done our mowing with one and the same pair of horses, working them from three to seven hours per day. The usual practice is to mow in the morning, two or three hours or more, as the case may be, and use the same team in the afternoon to draw the hay to the barn, which is from one to two miles distant. The speed required to work a machine to advantage is about the same as that for a plough on stubble land, or from two and one-half or three miles per hour. There is no objection to quicker speed, however, in making good work.

"The machines now made by Ruggles, Nourse, Mason & Co., one of which we have run the past season, are, with proper care on the part of the driver, such as to satisfy any reasonable man as to the "wear and tear" of the same; for, in cutting two hundred acres of grass, the expense for repairs on the machine was less than two dollars, or one cent per acre, and this defect has since been remedied by the makers.

"We have never used oxen, as we do our haying wholly with horses, believing that they are more economical than oxen, since pasturing is scarce and poor in our place, and it costs as much for hay and grain for oxen as it does for horses, and more time. But we have been acquainted with farmers that did use oxen to their satisfaction.

"The construction of the machine is such that, in our opinion, any man, with any practical knowledge of mechanics, would find no trouble at all in using the machine; but he must have some patience and a large share of perseverance. We would suggest, however, to a person beginning to work one, that he let it alone when the grass is wet. Let him never begin for the first time, when this is the case, if

he wishes to have it work to his mind, for he will find that it is not only more subject to clog, but the draught is nearly one-third more when the grass is wet than when dry.

"Then let him follow the directions of the maker strictly. Here is where most persons fail. Be careful in driving to keep the standing grass on the rihgt, and see that you cut the ground all over so as not to leave standing grass between the swaths; if this is the case, it is owing to the carelessness of the driver, and nothing else.

"Oil the bearings often to prevent friction, keep every nut drawn tight so as to prevent wearing, and there is no trouble. Any man that has fifteen acres of smooth surface, can afford, if he keeps a team, to own a machine; if not alone, he should join with his neighbors, and thus secure his crops in their season, and in good weather, and at a much less cost."

The same conclusion with regard to the economy of the use of the machine is arrived at by nearly all the writers of letters received on this subject; and the following, from Levi Stockbridge, Esq., an enterprising farmer, of North Hadley, is only a fair specimen of the whole. He says:—

"I consider it good economy to mow with a machine rather than with a scythe, on all farms that are not so wet or rocky that it may be difficult to use a machine. Taking labor at its cost in this vicinity, grass, on an average, cannot be cut at less than one dollar per acre with the scythe, and it will cost one shilling per acre to spread the swaths. With a good machine, taking into the account the wear, breakage, &c., it can be cut for fifty cents per acre, and the grass spread better than it is possible to do it by hand; saving, as you see, sixty-seven cents per acre by it.

"Question third it is not easy to answer definitely, as there is so much difference in the ability of horses of the same weight, and in the ease with which different machines are worked; on an average, I think a pair, to work a double machine, should weigh twenty hundred.

"I should choose to have my horses work on the machine in the month of July, rather than on a plough in stubble land, at the same time of year.

"As to the number of hours which the team could work per day, it will depend much on circumstances; but I should think from seven to ten hours, at a speed of one acre an hour.

"I think any intelligent man, who has been accustomed to use a machine, might point out some faults and suggest some real improve-

ments; but I think it far more free from faults than could reasonably be expected.

"I have never used oxen on the machine; but consider it practicable to use them.

"I think it best economy to use horses in this section. They are not so much affected by heat as oxen. It costs less to keep oxen, and they will do much less work. Cattle are little used in this neighborhood. It requires but little practice for any intelligent man to work the machine easily and to advantage; but at the present time many of our common farm laborers do not belong to that class.

"As to any suggestions for beginners, I would say, in general, 'live and learn.' To be more particular, get the best machine of the best pattern which you can find, and then study it until you 'know it like a book,' understand it in all its parts, and the relation which one thing has to another. Keep the knives sharp, for a dull knife will take more strength of team, and cause the machine to wear faster. See that it is always well oiled, that every nut and bolt is perfectly tight, and al things right. In mowing, take the field the longest way, if possible, leaving two swaths on the outside the first time you go around it to mow afterwards. Drive your team straight forward, if possible, without turning to right or left, and at a steady pace, so as to keep a regular motion on the machine. Round the corners, that you may turn with ease and dispatch. If your machine clogs or stops, or clogs in the grass, back it, and it will clear itself. Assist your team in backing by pulling on the track clearer. Don't ride on the machine, but walk behind it, for in that way you can tend it easier, and your horses will be relieved. These suggestions may suffice; but there are many others which practice will soon teach.

"Owing partly to the present exorbitant price of machines, I would not recommend the farmer to purchase in all cases; but to those farmers who cut a great deal of grass, and whose land is comparatively smooth, I would say, get and use one, you will never regret it.

"I have endeavored concisely to answer your questions; but on some points much more might be said. In the matter of economy, the machine will often save to the farmer more than the mere difference in the cost of cutting; for with the machine you can take the advantage of the weather, securing as much hay in a few days with it as you could in several weeks without it. The weight of team is another item. I have, during the past season, mown one hundred and fifty acres with a pair of horses that weighed but seventeen hundred; and that was not their exclusive business during the season of mowing. On one occasion they cut eight acres in three hours and

forty minutes, without any ado or great fatigue; the eight acres yielded sixteen tons of hay. That shows that a light team may do very good work with a mower. I have used Ketchum's four feet machine, which, I think, for our New England farms, is the best I have seen, but is susceptible of improvement in some respects. It is of easy draught, does its work well, and will run on almost every kind of land. The only trouble it has made me was, in mowing where there was a crop of fine rowen the year before, which was not cut; and there the scythe was equally at fault."

Such is the uniform testimony in the Connecticut Valley, where the machine is peculiarly adapted to extensive and economical use. The following, from Geo. C. Davis, Esq., an intelligent practical farmer, of Northboro', embodies the result of two years' experience with the machine. He says:—

"I think a farmer who owns his team and machine should reckon the cost of mowing at about fifty cents per acre, which is less than one-half it would cost to hire it mown with a scythe and the swaths spread.

"I find a small pair of horses, weighing say from eighteen to twenty hundred pounds, will work a machine quite as easy as a larger pair,—as they walk and turn easier on the sward, and, of course, are less liable to mire in soft places. The labor for horses on a mower is more severe than on a plough, mainly because they are driven faster. I think eight hours per day is as long as any pair of horses ought to work on the machine. They should be driven at the rate of about three and a half miles per hour,—suitable stops for breathing and resting not included.

"I have not yet seen a machine which I thought free from faults. Each patent has its apparent advantages.

"I have never used oxen on my machine to any extent, but have seen them work a machine very well. If I wished to use oxen, I should want a quick, fast-walking pair, and should accustom them to be driven and guided by the bit—using a straight bit, with straps attached to buckle back of the horns, for a headstall, guiding them with a common pair of reins, running through rings on each end of the yoke to the outside of each bit, the inside being tied between, according to the length of the yoke. In this way a man could walk behind his machine and watch its operation, and, at the same time, guide his team accurately. Oxen can be easily accustomed to the bit.

"Most New England farmers have better teams of oxen than horses.

If I had no horses, but had oxen, I think I could work them at much less cost than I could hire horses. Oxen, as a usual thing, are kept much cheaper than horses, because they are not usually worked as hard nor driven as fast; and the comparative cost of keeping each depends much on these contingencies.

"All the mowing machines that I have seen appear to me to be very simple in their construction. But when I know there are many farmers who do not know how to hitch a yoke of oxen to a modern plough and plough properly with it, then I must believe all cannot, at once, learn to use a mowing machine. But I have never been troubled in teaching almost any one with whom I would trust my horses, the use of the machine, after a few hours' showing. If a man is unskilled in the use of machines and wishes to use a mower, he would do well to learn of some one who has used the machine; but if he readily understands the use of machinery, he will quickly learn to run a mower without instruction. I have taught some in a few hours, while with others I have had to be near at hand for days.

"In a good neighborhood, where there are from fifty to one hundred acres of mowing suitable for the machine, it would do very well for farmers to own a machine; but the prices of machines, as at present sold, are at least thirty-three per cent. higher, in proportion to their cost, than most other farming implements."

In other parts of the State, also, similar results were obtained. The following, from that experienced farmer, Wm. F. Porter, Esq., of Bradford, will serve to show the general character of the whole. He says:—

"Dear Sir:—In answer to the questions contained in your letter of December 22, 1855, respecting my experience in the use of mowing machines, the comparative economy of their use and the common scythe, &c., I will state, as briefly as I can, the conclusions I arrived at from my experience the past two years.

"The machine I used the past season was manufactured by John P. Adriance & Co., and patented by J. H. Manny. With that, one man and two horses will cut ten acres of grass per day, yielding from one to two tons per acre, on land well laid down, working the horses not more than ten hours, leaving the man sufficient time to grind his scythes, and leaving the grass in the best possible condition for drying. The whole expense, if a man owns his horses, would be not more than three dollars, or thirty cents per acre. Men in this vicinity cannot be hired during the hay season

for less than $2 per day, including board, and will not average to cut and spread more than one acre per day, of grass yielding one or two tons per acre. A pair of horses, weighing one thousand pounds each, are sufficiently heavy to work the machine in any grass, and if well trained, it is less labor than to draw the plough in common stubble land, at the depth of seven or eight inches, or harrow the same hours per day. If the horses are well kept, say with six quarts of Indian meal and sixteen pounds of good hay each per day, they would work the machine, if no accident happened to them, ten hours per day as long as they could eat their allowance. The machine will do equally as good work at a speed of two and one-half miles per hour or more, at which rate it will not take more than fifty minutes to cut one acre. Most horses will walk three miles per hour with ease. I have not used oxen on the machine, but have seen them used by others when they performed the work well. I do not consider it economy to use them for various reasons: first, they cannot be driven so true, and will not travel so fast, and but few oxen can stand the heat of good hay weather; and what is more important, it costs much more to keep them, in which I am aware many good farmers will not agree with me; but such have not fed by weight and measure.

I have kept from six to ten oxen and four horses for the past five years, until last spring, when I dispensed with oxen altogether. I have learnt by actual experience the cost of keeping to be as follows: A pair of horses, weighing twelve hundred pounds each, will work every fair day during the year ten hours, and keep fat on six quarts of Indian meal and sixteen pounds of good hay each, per day. A pair of oxen, girting nine feet or weighing thirty or thirty-two hundred weight, will require four quarts of Indian meal and thirty pounds of good hay each, per day, provided they are kept at work as many hours as the horses. One pair of horses, of the above description, will perform as much work, on many farms, taking the whole year, as two pair of oxen, such as plowing, harrowing, drawing manure, hay, wood, &c., especially if much of the work is on the road; besides, it requires two men to work the two pair of oxen in many kinds of work, where one would work the horses. The cost of keeping a pair of horses as above, would be, at prices in this vicinity, at this time, thirty-two pounds of hay per day, at $25 per ton, forty cents, twelve quarts of Indian meal, at $1.12 per bushel, forty-two cents, total, eighty-two cents, or $299.30 for one year. Keeping one pair of oxen one day, sixty pounds of hay, $25 per ton, seventy-five cents, eight quarts of Indian meal, $1.12 per bushel, twenty-eight cents, total, for one day, $1.03, or $375.95 for one year.

"A man that can grind the common scythe well, and drive a pair of horses well enough to make good work with the plough, if he is possessed of ordinary Yankee skill and judgment, after one day's practice with a man experienced in the use of the mower, can work a Manny machine, if as well made as the one I have, without any difficulty, and on land well laid down, will cut the grass better and closer than it is usually done with the common scythe. The cost of repairs on my machine the past season, was much less than it would have been for the common scythe to cut the same number of acres. You ask me if I would advise the farmer to buy and use the machine, instead of cutting his grass with the scythe. Much will depend on the number of acres he has to cut, and the manner in which his lands are laid down to grass. If he has forty or more acres to cut, and his lands are in the condition every farmer's ought to be, I should advise him to use the machine. I am confident he can save more than one-half the cost of cutting his grass.

"There is room for improvement in the best mowing machine I have seen. I think if steel was used instead of wood, for the finger-bar of the Manny machine, it would satisfy any man."

Nor is the testimony of individuals, complete and valuable as it is on this point, the only means we have at command for forming a judgment on the question of the economy of the use of the machine and hand labor. In one instance, reported by the committee of the Worcester society, John Brooks, of Princeton, chairman, where a machine was owned and worked by Mr. Barrett, having a cutter-bar five feet in length, and with horses weighing in harness 1,968 pounds, driven at a moderate speed, only equal to 20 rods a minute, or $3\frac{3}{4}$ miles an hour, a half-acre, 20 rods by 4, with a burden of 2,400 pounds of hay to the acre, was cut in fourteen swaths, an average of $4\frac{71}{100}$ feet, in eighteen minutes, including the turnings. This would be $2\frac{91}{100}$ miles the hour, including the turnings. At this rate 1,210 square feet of grass were cut in a minute. At the same time a good mower cut a swath 168 feet long and 7 feet wide, making 1,176 square feet in $3\frac{1}{2}$ minutes; or, at the rate of 336 square feet in a minute, allowing no time for rest or to sharpen the scythe. Now, allowing the machine no time for rest or turning, it cut a swath $4\frac{71}{100}$ feet wide and 20 rods long, equal to $1{,}554\frac{3}{10}$ square feet in a minute, or $4\frac{65}{100}$ times more than a good mower with a scythe in the same time. It is natural to suppose that a man mowing with such a competition and a large

number of spectators would exert himself to his utmost, and that he could not mow half a day at the same rate, and it is certain that he was far better as a mower than the average of farm laborers, while at the same time it is evident from the above-named speed, that the team with the machine could work pretty steadily. It is, therefore, fair to state the comparative quantity cut by the machine in this experiment, as five times greater than that cut by the mower. That is to say, one man, a pair of horses and a machine, would cut as much in a half day as five men, or a pair of horses and a machine equal to four men. Now, as to the work performed, it was admitted by all that the machine cut much the best; and when it is considered that with the *mowers*, one man is required to every five to do the spreading, we have to credit the machine with another man's labor in spreading, or a machine and horses equal to five men instead of four, or including the driver, machine and horses, equal to six men. This supposes, we will say, a half-day's work. The cost of the six men for the half-day in haying, in New England, would be at least four dollars and a half. The cost of a driver would, at the same rate, be seventy-five cents for the half-day. The keep of the horses, at seventy-five cents per day, would be equal to thirty-seven and one-half cents, and allowing for the use of the machine a dollar a day, which is, perhaps, a fair charge, we have, for the cost of machine labor, one dollar and sixty-two and one-half cents, instead of four dollars and a half, or, adding a dollar more for the interest on cost of horses, and we have two dollars and sixty-two and one-half cents to compare with four dollars and fifty cents, the cost of men.

In another instance, on the farm of Mr. Hovey, of Sutton, reported by the same committee, where a four feet eight inch cutter-bar was used, instead of five feet, the horses weighing 1,820 pounds, instead of 1,968; the trial was made on a piece similar to the last, 4 rods by 20, having a burden equal to 2,700 pounds of hay to the acre, the machine made 17 swaths, averaging $3\frac{88}{100}$ feet to each, mowing the half acre in 19 minutes, at a speed, including turnings, of $3\frac{35}{100}$ miles an hour, cutting $1{,}146\frac{31}{100}$ square feet of grass a minute, including the turnings. A good mower, on the same field, cut a swath 20 rods, or 330 feet long and $6\frac{1}{2}$ feet wide, or 2,145 square feet, in $7\frac{1}{2}$ minutes,

or 286 square feet in a minute, allowing no time for rest or sharpening the scythe. Here the machine cut $4\frac{2}{100}$ times as much as the man, or, allowing the machine no time for rest or turning, it cut $1{,}270\frac{4}{10}$ square feet a minute, or $4\frac{44}{100}$ times more than the man in the same time. In the first instance, $4\frac{65}{100}$ times, with the five feet cutter-bar.

Many other experiments, in different parts of the State, have come within my knowledge, where the results were so nearly alike as to lead to the conclusion that the above is a fair calculation for lots similarly situated; but the following from the report of the above-named committee will be found to confirm the testimony already given. On the 18th of July—

"The committee inspected a machine owned by and worked on the farm of George C. Davis, Esq., in Northborough. This machine was No. 2, working with a cutter-bar four feet eight inches long, drawn by two horses, weighing 2,084 pounds, driven by Mr. Davis's man; speed, when cutting, twenty rods the minute, or three and three-fourths miles the hour. The trial was on a plot of land four rods by twenty, containing one-half acre, and was mowed in sixteen swaths, averaging four and twelve-hundredths feet each swath, and in twenty minutes' time; speed, including turnings, three miles per hour. Hay, per acre, 2,700 pounds. The ground was more uneven than Mr. Hovey's, or it would have been cut over in the same time. Mr. Davis's man mowed a swath with a scythe, twenty rods, or three hundred and thirty feet long and seven feet wide, or two thousand three hundred and ten square feet, in nine and one-half minutes, allowing no time for rest or sharpening his scythe, equal to two hundred and forty-three square feet in one minute. This machine mowed, allowing no time for rest or turning, one thousand three hundred and fifty-nine and sixty one-hundredths square feet the minute, five and fifty-nine one-hundredths times more than the man in the same time.

"July 19. The committee examined the working of a machine owned and worked by Walter Bigelow, Esq., on his farm in the city of Worcester. This was a No. 2 machine, with a cutter-bar four feet eight inches long, drawn by two horses, weighing 1,920 pounds, driven by Mr. Bigelow himself, at a speed, when cutting, of twenty rods a minute, or three and three-fourths miles the hour. This half acre, twenty rods long and four rods wide, was cut in sixteen swaths, averaging four and twelve one-hundredths feet each swath, and in twenty-three minutes' time; speed, including turnings, two and sixty-one one-hundredths miles the hour. The grass on Mr. Bigelow's land was stout

and much thicker at the bottom, consequently more difficult to cut than that of either of the other competitors, and would yield 3,300 pounds of hay to the acre. Mr. Bigelow's man mowed a swath with a scythe, twenty rods long and seven feet wide, allowing no time for sharpening his scythe or rest, in ten minutes, equal to two hundred and thirty-one square feet the minute. The machine, allowing no time for turning, cut a swath four and twelve one-hundredths feet wide and twenty rods long, equal to one thousand three hundred and fifty-nine and sixty one-hundredths square feet the minute.

"The last view of the committee was on the fourth day of August, when they inspected the working of a machine owned by John P. Adriance, of the city of Worcester, and worked on the farm of Mr. D. L. Emerson, in Auburn. This machine was Manny's patent, with a cutter-bar four feet and seven inches long, drawn by two horses, weighing 1,695 pounds, driven by Mr. William Emerson, at a speed, when cutting, of twenty rods in seventy seconds, or three and twenty-one one-hundredths miles the hour. The half acre was twenty rods long and four rods wide, the ground smooth and even; produce, one ton of hay to the acre. The half acre was cut in sixteen swaths, averaging four and twelve one-hundredths feet each swath, in twenty-six minutes' time, or at a speed, including turning, of two and thirty one-hundredths miles the hour, cutting eight hundred and thirty-seven and sixty-nine one-hundredths square feet a minute. This machine cut, allowing no time for turning, a swath four and twelve one-hundredths feet wide and twenty-rods long in seventy seconds, equal to one thousand one hundred and sixty-five and thirty one-hundredths square feet in a minute. Mr. Emerson's horses were lighter than those of any other competitor; but they worked well, and he managed them well, cutting his swath within forty-six one-hundredths of a foot of the whole length of his cutter-bar.

"The five machines cut as follows, allowing no time for rest or turnings:—

Mr. Barrett's	cut	in	one	minute,	1,554.30	square feet.
Mr. Hovey's	"	"	"		1,270.40	" "
Mr. Davis's	"	"	"		1,359.60	" "
Mr. Bigelow's	"	"	"		1,359.60	" "
Mr. Adriance's	"	"	"		1,165.30	" "
The five cut, in one minute,				. .	6,709.20	" "

Averaging 1,341.85 square feet the minute.

"The four men cut in the same time, allowing no time for rest or sharpening scythes:—

Mr. Barrett's man cut		336	square	feet	the	minute.
Mr. Hovey's	"	" 286	"	"	"	
Mr. Davis's	"	" 253	"	"	"	
Mr. Bigelow's	"	" 231	"	"	"	
The four cut, . . .		1,096	"	"	"	

Average, 274 each man the minute.

"One machine cutting a fraction less than four and ninety one-hundredths times more than one man in the same time. The gentlemen competitors all concurred in the opinion that they could mow with their machines nine acres in a day, following it day after day. This, divided by four and ninety one-hundredths, would make a fraction more than one and eighty-three one-hundredths acres for a day's work for one man, which is probably no more than the average of men would accomplish in one day.

"The machines cut the grass quite as well as it would be done in general by men with a scythe. They leave the grass better spread for curing than it could be done with a fork by hand labor, saving the time of one man, which it would take to spread the swaths after the four and ninety one-hundredths mowers. Thus it appears by these trials that a machine will perform the labor of four and ninety one-hundredths men in mowing, and save the labor of one man spreading swaths, costing daily with horses and driver about $4.50, while the five and ninety one-hundredths men would cost about $9 00. Mr. Barrett managed his horses best, having cut his swath within twenty-nine one-hundredths of a foot of the whole length of his cutter-bar. The extra length of his bar, and the good management of his horses, enabled him to cut his half acre in less time than either of the other competitors. Mr. Emerson stands next to Mr. Barrett in good driving, cutting his swath within forty-six one-hundredths of a foot of the whole length of his cutter-bar, Mr. Davis and Mr. Bigelow cut their swaths within fifty-four one-hundredths of a foot of the whole length of their bars, and Mr. Hovey cut his swath within seventy-eight one-hundredths of a foot of the whole length of his bar. If Mr. Hovey's horses had been accustomed to working together, he would probably have cut as wide as Mr. Bigelow, or Mr. Davis."

JOHN BROOKS, *Chairman.*

One competitor, in his returns made to the committee, says :–

"I have not aimed at, nor do I claim to have accomplished, any very remarkable day's work with my machine; indeed, the haying season has been such that I have not deemed it prudent to cut a large number of acres at a time. But in what I have done, I think I have convinced those who have witnessed the operation of my machine this season, that good mowing can be well done with a machine on tolerably smooth land, and as well done as the best of work with a scythe, and that the machine worked by a pair of horses and a man of ordinary skill, will cut on an average one acre per hour, fair work.

"I have met with no accidents or breakages this season nor last; but I was greatly annoyed in my first attempt to mow last season, by the failure of my machine to operate as I had expected, which brought down no small amount of ridicule and wise sayings from lookers on. However, I soon found out the want of success was owing to imperfect castings or gearings, which were then put into the machine. After they were replaced with those of a more perfect manufacture, the machine has come nearer to my expectations. The great improvements now to be made are in the form of the cutter-bar, the fingers and the knives. In all these I think there may be many desirable improvements made. But in whatever improvements are attempted, I hope machinists will keep in mind, that a cutter-bar which can be safely approached while the machine is in motion, is always desirable. Then, again, with a very little alteration in the plan of the frame work, it can be so arranged as to be easily shifted, so as to use either one or two horses as convenience might require. When there are many turns to make in consequence of unevenness of ground, trees, rocks or other obstacles, it would be desirable to use one horse and a short cutter-bar.

"My horses were no 'fancy-matched nags;' they were such as I had, and as they worked very well together, though of considerable difference in weight, I have learnt from this circumstance, that a horse of medium weight, say between nine and ten hundred pounds, will perform his share of the work the easiest, as he walks easier and more safely on the sward, particularly when it is soft and wet."

Another competitor says: "The time was carefully measured by a watch, and was daily set down with the work done in my farm diary. I took, myself, a general superintendence of the time and the work done, which was satisfactory, and pronounced by farmers far better than could be done by the com-

mon scythe. Neither of the horses was less than twenty years old, and they weighed about one thousand nine hundred pounds. No accident occurred during the proceedings, except the breaking, at different times, of ten teeth of the machine, which were immediately and readily repaired. The general average of the work in point of time, was, that an acre was mown in forty-three minutes."

From what has already been said, and from the testimony of many practical farmers, as stated above, it appears that the estimate already made, requiring five men to do the work of one man, machine and team, or six men, including the spreading, is a very reasonable one, since, in the cases stated, no allowance is made for the want of endurance of the men at the rate at which they worked in the experiments named.

Other considerations give further credit to the machine, since the grass was mown better than the average of good mowers, while it is easy to see that it was spread better by the machine, thus making a saving in the quality of the hay cured.

The cost of a man, machine and horses for a day, according to what has been said, would be not far from $4.50, while the cost of their equivalent in men would be not far from $9. This calculation is based on the cost of keeping the team, and price of labor on the small farms of New England, and it seems to show the economy of machine labor there. How much more valuable may it not be on the large farms of the Middle and Western States?

But, with regard to the economy of the use of the machine, it seems to me, that even if the cost per acre were the same as by hand labor,—and all unite in putting it less,—we should, nevertheless, consider it a great and clear gain to have it in our power to substitute machinery which will cut grass well and rapidly at a time when labor is very difficult to obtain, without paying an exorbitant price for it. And even supposing the money cost of hand and horse labor to be the same, there is still this further consideration in favor of the machine, that, as a general rule, every mechanical operation which can be affected at all by machinery will be performed more accurately, more uniformly, and therefore more economically, than by hand labor.

Among the important lessons taught us by the use of the

machine during the past season, and referred to by some of the committees, is, that the fewer division fences on the farm the better. It has been the custom from time immemorial, to dispose of the stones turned out by the plough, in ugly-looking stone walls, which mar the beauty of the farm, and occupy much land which is now thought to be worth something for the purposes of cultivation. The idea was to have a frequent change of pasturage for cattle, rather than to allow them to range over a wide extent without much confinement. Of the many fields mown by the competitors for the $600 prize offered by the Massachusetts Society for the Promotion of Agriculture, the average size was only *four acres!* and, leaving out the rich meadows of the Connecticut, the average would fall below that. This minute subdivision of farms is a great impediment to the economical use of machinery, and even of animal power to any great extent, and many an old wall which was built fifty or a hundred years ago, and has come to occupy twice or three times the space originally allotted to it, is now being removed and buried beneath the surface or otherwise disposed of. With small lots the farmer loses the time of turning, at every furrow in ploughing and other operations of a similar nature, like the use of the mowing machine, the horse-rake, &c. There is one advantage, however, of no small importance, in these division fences in New England, and that is, the protection which they afford to the field in breaking the fierce winds, in arresting leaves and dust, which settle upon and fertilize the soil.

Another important lesson taught us by the use of the machine is, that the stouter the grass is, (other things being equal,) the more easily and economically it can be mown, and hence the importance of a high and thorough cultivation of all grass lands,—not simply in the clearing away of stones, stumps or other obstructions, which the use of the machine will lead to, but in the use of more manure, and the more complete and thorough tillage with the plough, the harrow and the roller. Many farmers, in all parts of the State, have already taken the hint, and are preparing their lands with reference to some future use of a mowing machine.

But the returns made to the Society by the competitors for the premium, and my own observation of the use of the machine, establish conclusively that the machine can be used in a

far greater variety of circumstances than was at first supposed. I have seen them operate safely and advantageously on rough lands covered with stones, on hilly and broken surfaces, reclaimed bogs and salt marshes, with two horses, with one horse, and with oxen, and with fewer accidents than might reasonably have been anticipated under the circumstances of a new implement, want of experience and skill incident to the introduction of machinery, &c. It is, nevertheless, true that it will prove to be a great saving in the end, to put the field in good condition, have it free from stones and all other obstructions, and many doubt whether it is economical to buy and use a machine till this state of cultivation is attained.

The average time required to cut a half acre by the different machines competing for premium, was twenty-two minutes, or forty-four minutes per acre. One of the competitors, as appears above, cut, on one occasion, eight acres, yielding sixteen tons of hay, in three hours and forty minutes, or at an average rate of twenty-seven minutes per acre! After making all necessary allowance for stoppages to rest the team and occasionally to repair the machine, we may reasonably estimate the work which could be done, without over-urging, at an acre per hour.

As to the power required, all the reports concur in saying, that though the machine does not yet run so easily as it might and ought, still there is less labor for the horses than in ploughing. In most cases the horses actually gained in weight while they worked with the machine. This is the testimony, not only of competitors, but also of committees of county societies appointed to aid the committee of the State society in making up their decision. One of these committees says: "the team used may be called a fair average of farm horses, the pair weighing about two thousand pounds. They required no urging, so far as we could observe, but performed their daily work on the machine with ease, and could they give an opinion, your committee have no doubt they would consider mowing the most agreeable part of the harvest labor."

It is also the opinion of most who have used the machine; that horses of medium size, say from nine to ten hundred pounds in weight, do their work, on the whole, with greater ease and safety than larger ones. This is especially the case on soft or wet ground.

Much observation leads to the belief that, at the rate of an acre per hour, including all ordinary stops, a good pair of horses could continue the work so as to cut, without undue exertion, from ten to twelve acres a day.

Many think it to be far more economical to use oxen than horses on small farms, and hence most farmers in New England prefer the former to the latter. It was, therefore, highly gratifying, in cases where the mowing machine was worked by oxen, to find that they did as well as horses, while they did not apparently suffer from the exertion, even in the hot weather of July. This fact will make it possible for many to use this implement who could not otherwise do so, and its advantages will thus be brought within the reach of thousands who cannot afford to use horses. Such is the situation of a large class of farmers in New England, and we can hardly over-estimate the importance to them of the fact above stated. On larger estates it is not improbable that the labor of horses might be found to be more economical.

There are some general suggestions for beginners in the use of the mowing machine, most of which are alluded to in the letters of practical farmers already quoted, but which may be briefly summed up as follows :—

First. See that the knives are sharp and in good order. No man would think of beginning his day's work of mowing without having first ground his scythe. A dull scythe requires too great an expenditure of physical force, and the mower works to great disadvantage. The same is true of the machine. The labor for the team is quite sufficient even under the most favorable circumstances, without increasing it by neglect in this particular.

Second. See that every nut and bolt is perfectly tight; the wear of the machine will be less, and it will be less likely to get out of order.

Third. Keep all the bearings well oiled with pure sperm oil; some of them will need an application of it every ten or fifteen minutes.

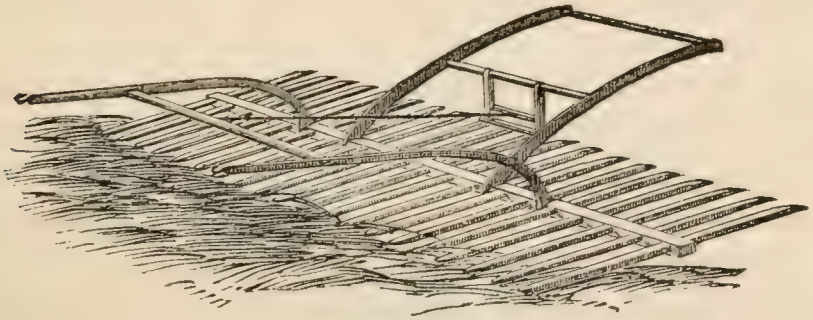
Fourth. Take the field lengthwise and keep straight forward at a regular, steady pace, without too great haste, which would fret and worry the team. An acre per hour is fast enough

ordinarily, and the team will do that without over-urging, if the driver be skilful.

Other things of minor importance will suggest themselves after a little practice. But it is especially important to have patience and perseverance, and not to give up in discouragement on account of a failure at the outset, nor even if there should be a second or a third mishap; for if proper care was taken in selecting the machine, these difficulties show either the want of sufficient study of all its parts or some mistake in putting it together. Many will give up in despair, if they have met only with some one of the slight accidents to which every new implement is liable, particularly when time presses and things go wrong.

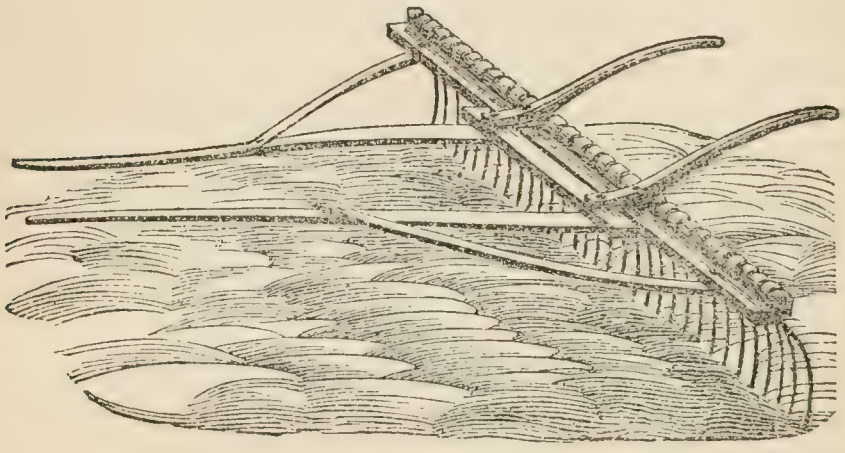
That some degree of skill is necessary for the proper use of the mowing machine is no objection to it, since even the common scythe requires skill, and it is rare that any man who has failed to obtain that skill by practice, when young, ever becomes a good mower. If the machine were so complicated that only a mechanic could operate it, no doubt the fact that it was so would be a serious obstacle to its introduction. But this is not the case, and it is the general testimony that any farmer of ordinary capacity can very soon learn to work it successfully.

Nor have the improvements in raking hay been less marked than in mowing. The horse-rake, at first received with caution, as if an encroachment, with the expectation that its use would be a ruinous innovation, is now almost universally found on the farms of New England, and I suppose in other parts of the country.



Revolving Horse-rake.

The labor which may be performed with a good horse-rake has been found to be equal to that of eight or ten men. From twenty to twenty-five acres of heavy grass can be raked by a revolving horse-rake in a day.



Spring Tooth Horse-rake.

It will be remembered that, in raking, the work to be performed is comparatively light, and does not require the exertion of a great amount of strength. In this and all similar labors, the application of animal power is of the greatest advantage, as it multiplies the efficiency of the hand many times. Such is the case with the hand drill for sowing carrot and other seeds, where the labor by hand is slow, and though light, is laborious and irksome.

What has been said of the mowing machine, applies with equal force to the reaper, into which the former may be easily converted.

Many of our grain crops, like wheat, barley and oats, come to their maturity at nearly the same time. Some varieties of oats are very easily shaken out, and never should be allowed to become overripe; wheat is very liable to sprout in moist weather, and barley to become discolored, if allowed to stand too long. The work of harvesting by the old methods was necessarily protracted. Previous to the introduction of the reaper very large quantities of our most valuable grains were annually lost, from the impossibility of harvesting them properly and in time. It is not too much to say, that the successful introduction of the reaper into our grain fields has added many millions of dollars to the value of our annual harvest, not only by

enabling us to secure the whole product of all that was before planted, but also by making it possible for the farmer to increase the area of his cultivated fields, with a certainty of being able to gather in his whole crop.

The sickle is undoubtedly as old as the days of Tubal Cain, and was almost universally used till within the memory of men still living. No one, who has had a practical experience of its use, can fail to appreciate the immense saving of slow and wearisome hand labor by the use of the reaper.

The reaper is no new thing in point of fact. It would, indeed, have been an astonishing evidence of stupidity on the part of the ancients, who relied mainly upon wheat and the other small grains, had they not, at least, tried to replace the sickle by something better. This they did. They were accustomed to use a simple reaper in France, a few years after Christ, for Pliny asserts that the inhabitants of that country fixed a series of knives into the tail end of a cart, and this being propelled through the grain, clipped off the ears or heads, and thus it was harvested.

In England, the importance of adopting some method to shorten the labor of harvesting grain was early seen, and efforts were made to accomplish this end, at the close of the last and the beginning of this century. The first patent granted for a reaping machine was that to Boyce, of London, in 1799. Then followed the patent of Meares in 1800, that of Plucknett in 1805, and that of Cumming in 1811, clearly foreshadowing some of the useful improvements of subsequent patents. Smith, of Deanston, Scotland, invented a machine in 1812, which with some improvements, worked successfully, though it had only a local reputation till 1835, when it was used before the Highland and Agricultural Society. The next model was produced by Dobbs, on the stage of the Birmingham theatre, in 1814.*

* The handbills posted in the streets state that the performance was for the "Benefit of Mr. Dobbs." "J. Dobbs respectfully informs his friends and the public, that, having invented a machine to expedite the reaping of grain, &c., and having been unable to obtain a patent, until too late to give it a general inspection in the field with safety, he is induced to take advantage of his theatrical profession, and make it known to his friends, who have been anxious to see it, through that medium. Part of the stage will be planted with wheat that the machine has cut and gathered where it grew, and the machine worked exactly as in the field." The *Birmingham Gazette*, shortly after, said the "first experiment was completely successful."

In 1822, another machine was brought before the public, and several of the successful reapers of a later date were modelled after it. Bell, of Scotland, obtained a prize for a reaper, as early as 1829. This machine remained in comparative obscurity till the World's Fair, in 1851, when the success of the American machines again stimulated the inventor to come forward as a competitor. Previous to 1851, Bell's machine had never been in general use, though used to a limited extent in the neighborhood of the inventor. Its great weight and other defects made it difficult to use for reaping in the field.

Hussey's Reaper.

In the meantime, Schuebley, of Maryland, invented a machine thirty years ago, on which a patent was granted in 1833, the same year in which Obed Hussey, of Baltimore, obtained a patent on a reaper, which has not only been extensively and successfully used from that time to this, through the Western States, but which has furnished the basis for the most successful models in this country, among the most noted of which are those of McCormick, of Virginia, Ketchum, of New York, and Manny and Atkins of Illinois.

The American reaping machines, some of which have been extensively used for the last twenty years, have a world-wide reputation, and a generally-acknowledged superiority, and the credit of having made the principle which the English and Scotch had invented, practically useful, undoubtedly belongs to our ingenious mechanics. So steamboats were invented and made long before the time of Fulton; but to him belongs the credit of making their common use practicable, and no one thinks of refusing to give him the full credit of the invention.

It is not my province to specify which of the machines lately patented, is, on the whole, the best, or to point out the parts in which each excels the others. Every farmer has the means in the reports of the various committees appointed to determine the relative merits of the machines now in use, of forming a tolerably correct conclusion in regard to these matters. But, during the past season, there has been one trial so interesting to all Americans as to deserve especial mention. I refer to that made under the direction of the Industrial Exhibition at Paris.

This took place on a field of oats, about forty miles from the city, each machine having about one acre to cut. Three machines were entered for the first trial, one American, one English, and a third from Algiers, all at the same time raking as well as cutting. The American machine did its work in twenty-two minutes, the English in sixty-six, the Algerian in seventy-two. At a subsequent trial on the same piece, when three other machines were entered, of American, English and French manufacture, respectively, the American machine cut its acre in twenty-two minutes, while the two others failed. The successful competitor on this occasion, "did its work in the most exquisite manner," says a French journal, "not leaving a single stalk ungathered, and it discharged the grain in

the most perfect shape, as if placed by hand, for the binders. It finished its piece most gloriously."

The contest was finally so narrowed down, that it was confined to three machines, all American. One of these now gave out, leaving but two to strive for the prize.

The machines were afterwards converted from reapers into mowers, one making the change in one minute, the other in twenty. Both performed their task to the astonishment and satisfaction of a large concourse of spectators, and the jurors themselves could not restrain their enthusiasm, but cried out "good, good, well done!" while the people hurrahed for the American reaper, crying out, "that's the machine, that's the machine!" "All the laurels," says the report of a French journal, "we are free to confess, have been gloriously won by Americans, and this achievement cannot be looked upon with indifference, as it but plainly foreshadows the ultimate destiny of the New World!"

With respect to the materials used in the manufacture of reapers and mowers, particularly the latter, there is a difference of opinion as to whether the frame should be of wood or of iron. The weight of opinion seems to be, that for all practical purposes, wood is the better material. The iron cutter-bar has been tried to some extent, but not sufficiently to lead to its adoption in all cases. But that the materials of which these implements are constructed should be far better than they have generally been, there can be no question. Many of the bolts in some of the machines have been made, apparently, of a poor quality of iron, while they should, perhaps, have been made of steel, and in the most perfect manner. A large proportion of the accidents which occurred during the work of the past season, arose from the breaking of bolts and fingers. These, though apparently trifles, cause not a little annoyance and interruption. Accidents will happen, it is true, even with the common scythe; but those referred to, are, for the most part, such as a more careful construction would prevent.

The manufacturer, who, for the sake of a trifling saving, slights his work on a machine newly introduced, so as thereby to retard its introduction, and create a want of confidence in the machine itself, must indeed be blind to his own interest, while he both strikes a blow at his reputation, and what is of

infinitely greater consequence, delays and retards the whole progress of agriculture.

The improvement in instruments for separating grain has not been less marked than those by which it is harvested. The wants of American farmers in this department of agricultural labor have been wisely and successfully studied. It is not many years since the best means of threshing grain was by the use of the old-fashioned flail,—a slow and laborious process. I have even seen wheat and oats trodden out by oxen after the method of the ancients, and I have myself driven the oxen for this purpose many a day, not merely to try it as a matter of experiment, but in real earnest, as if it were the best method in the world. But what a waste of time and labor! We can hardly conceive how any farmer can afford to use these slow methods; and yet such is the tenacity of habit, that some are still found treading contentedly in the old paths, while improvements go on unnoticed around them.

At the trial of threshing machines at the Paris Exposition, the victory was won by an American machine, and during the operation, to ascertain the comparative rapidity of threshing, six men were engaged in threshing with flails, who, in one hour, threshed sixty litres of wheat. In the same time

Pitt's American machine	threshed	740	litres	of	wheat.
Clayton's English	"	"	410	"	"
Duvoir's French	"	"	250	"	"
Pinet's French	"	"	150	"	"

And a French journal, in speaking of the trial, said: "This American machine literally devoured the sheaves of wheat. The eye cannot follow the work which is effected between the entrance of the sheaves and the end of the operation. It is one of the greatest results which it is possible to obtain. The impression which this spectacle produced on the Arab chiefs was profound."

Machines for threshing are capable, if properly made, of doing the work of fifteen men.

These vast improvements in harvesting and threshing grain will seem to be of the utmost importance, when it is considered that we annually raise more than one hundred and seventy-five millions of bushels of wheat, and of rye, barley and oats, over one hundred millions, and that the resources of the country

may be developed by the use of machinery to an extent far beyond the reach of present calculation.

Other motive powers are earnestly sought after, and the application of steam to agricultural purposes is a step in the progress of farming, whose results no mind can now foretell; for though experiments have as yet met but a limited success, we may remember that such was the progress of many of the grandest inventions of the age. It is probable that, so far as its application to the immediate cultivation of the soil is concerned, better results will be attained from experiments in substitution of the process of spading than of ploughing, and researches should, it seems to me, be turned into this direction.

The reaper, the thresher and the mower, are types of the ever restless and progressive spirit of the age. The ultra conservative may resist them as innovations for a time; but their language is too powerful and persuasive to be long unheeded. They speak to us of a glorious future, in which they will accomplish for us and for our country, triumphs grander far than the triumphs of arms, for they will develop means of supporting the millions of human beings which the implements of war can only destroy.

We would not fix the bounds to human possibility, or suppose for a moment that the ingenuity of man will not devise further means of relieving, to some extent, the amount of toil, both of men and animals, by pressing into the farmers' service some of the giant forces of nature.

Far back, in ages past, men dug the earth, and sowed the seed, and reaped the grain; but, while the myriads toiled without aspiration or hope, civilization was confined to the few; the mechanic arts languished, and the gigantic forces of nature still waited the hand of a master to awaken them into beneficent activity. The river rolled on for more than a century after Christ, without turning a wheel; the wind swept over the hills of Europe till the eleventh century, without giving motion to a single mill; the mighty power of steam lay hid for ages, till, at the call of genius, it rose up to alleviate the toils of man, and accomplish the work of a thousand hands by a single wave of its stalwart arm. The thought embodied in machinery, in its turn, excited thought and skill again; knowledge gradually spread among the masses; and the masses, to diminish labor

and gain time, invented new machines. But mind has not yet fallen asleep, nor has genius exhausted its creative power, and the future must show even more improvement than has been seen in the past. Thus agriculture may rise by rapid steps to the dignity of a science, seeking the means of obtaining animal and vegetable products for the support of man, in the most perfect and economical manner.

We cannot hope to avoid labor; but to make labor attractive, agreeable and productive, to bring into subjection the rude forces of nature, and make them do our bidding and increase our stores, to redeem thousands of acres, now lying waste, from wildness and desolation, and to make our country the granary of the world,—these are triumphs we may hope to gain from the introduction and use of improved machinery; and in this view the subject commends itself to the attention of the highest intellect, and opens a field for the labors of the noblest philanthrophy.

It will be remembered that one of the original objects of the enlargement of the State House was to obtain space for an agricultural museum, in connection with the office of the Secretary of the Board. It is intended that models of farm implements, illustrating the past and present history of this department of husbandry, shall be exhibited here under the most favorable circumstances. The collection is to include, also, models of the fruits of New England, and specimens of all the varieties of grasses, together with a statement of the botanical and proper names of each, the name by which it is known in different localities, the soil in which it flourishes best, and other items of information important or interesting to the cultivator; specimens of all the grains and remarkable vegetable productions calculated to illustrate an improved condition of rural economy, and of all the soils of the State, collected during the late geological survey, all the mineralogical and geological specimens, and all the birds, with the means of studying the character and habits of each variety; in short, it is designed to make the collection as perfect and useful as possible.

Increased facilities will also be provided for the distribution of valuable seeds. During the past year many thousand packages of seeds of many different varieties have been distributed

in all parts of the State, and this will hereafter be made a more prominent object of attention. A regular system of exchange, by which plants, fruits, &c., which have been found to succeed in one section, could be brought to the notice of the agriculturists of other localities, is highly desirable. Many very fine seedling fruits, for instance, have, at different times, come to my knowledge, which enjoy only a local reputation, not being generally known even to horticulturists. Why should not every improvement of this character be made to benefit all parts of the State? Why should not progress in one locality help on progress in other places, and thus become a common advantage? If those who possess superior varieties, whether of grains, vegetables, fruits or flowers, could but send them to some central point for distribution to others, receiving an equivalent or more than an equivalent in return, no harm could accrue to any one, but there would be a decided advantage to many. It is designed to effect this object as speedily as possible, and the co-operation of all interested in the matter is respectfully invited.

During the past year, also, an effort has been made to call attention more distinctly to the importance of preserving and protecting many birds known to be useful to the farmer, but which are often wantonly destroyed to the great injury, as it is thought, of the whole community. The following circular was addressed to individuals in various parts of the State, previous to the last annual Fast:—

State House, Boston, March 26, 1855.

Dear Sir,—There is a custom, very prevalent in many sections of the State, of regarding the annual Fast as a holiday, and using it for gunning and shooting. Many thousands of our most useful and beautiful birds, to none more useful than to the farmer, since they destroy innumerable insects injurious to vegetation, are then sacrificed to the wantonness and cruelty of those who know not what they do. Many painful instances of this came to my knowledge a year ago, when robins, bluebirds, sparrows, and other varieties of birds, which occasionally visit us in early spring, were shot down without distinction or mercy.

I need not say that, apart from the pleasure and delight which these innocent creatures afford, the injury done to the farmer, and to the

community at large, by their destruction, is almost incalculable. I take this occasion, therefore, to entreat every farmer, and every man who has any regard for the public good, to use his influence to put a stop to this practice, not only on his own premises, where he has an undisputed right, but throughout his neighborhood and town. Stringent laws already exist against the destruction of birds. Let every man see to it that these laws are rigidly enforced, and rest assured that he will be richly rewarded, not only by the consciousness of an act of mercy in preventing their annual and rapid diminution, but also by the fulness of joy and song with which these sweet messengers of heaven will surround his dwelling, and testify to every passer by that there is practical Christianity enough in its owner to protect and save them.

I will thank any man, in any section of the State, to inform me of the extent of the violation of the laws of mercy, and of the Commonwealth, in order that, if necessary, more effectual measures may be taken to protect the birds, and thus invite and encourage them to live among us.

Very respectfully, your obedient servant,

CHARLES L. FLINT,

Secretary of the Board of Agriculture.

Many letters were received in answer to this call for information, showing clearly that the public sentiment was right with regard to the subject, and that if it could be brought to bear with sufficient force, against the authors of the mischief, the evil would be checked. Meantime, the law against the destruction of birds was made more stringent, and it is made the duty of the selectmen of towns, and the mayor and aldermen of cities, to cause the provisions of the law to be enforced within their respective limits. In addition to the laws and regulations now in force throughout the Commonwealth, it would be well for each town to take measures to effect the object more surely within its limits.

It gives me much pleasure to be able to report the continued prosperity of the various agricultural societies of the State. Within the last year two new associations have been added to the number of those previously existing, and all are now doing well. During the same period, the number of active members has been largely increased, and there is less difficulty than formerly in obtaining funds to meet inevitable pecuniary demands.

We cannot doubt that these societies have exercised and still continue to exercise a very beneficial influence.

The financial returns of the societies will be found in the Appendix, to which reference is respectfully made.

In conclusion, I may be allowed to express the satisfaction which, in common with all who sincerely desire the advancement of our agriculture, I feel in the present encouraging aspect of that great interest. A general desire of improvement prevails among substantial cultivators of the soil, and this is continually producing its natural good effects. One thing, however, seems still to be wanting, and that is a combined, earnest and vigorous determination on the part of agriculturists to raise their occupation to its true rank and dignity in the popular estimation.

The most accurate, practical knowledge, and careful observation are, as they always have been, the basis of success in farming. But while these attainments are justly appreciated, may not attention be profitably paid, also, to branches of science connected with farming, and to the application of their principles to its daily operations? Would not the skill and practice which are so essential, be more speedily and easily acquired, and be more useful after their acquisition, if aided and guided by a knowledge of sound scientific principles? Much, it is believed, has already been done, and the basis of a true progress has been laid in unimpeachable facts. The government has wisely contributed to the development of an art so essential to the well being of all civilized society; and while its aid is generously extended, it should, at least, lead to improved modes of cultivation, and to a high standard of agricultural knowledge.

CHARLES L. FLINT,
Secretary of the Board of Agriculture.

Boston, January 21, 1856.

REPORTS OF COMMITTEES

APPOINTED TO VISIT THE

AGRICULTURAL EXHIBITIONS.

ESSEX.

The annual fair of this society was at Haverhill, on the 26th and 27th of September. Your delegate was on the ground during the first day, but is under necessity of relying upon the statements of others for what transpired on the second.

The prominent points of interest were, the exhibition of cattle; the show of fruits, vegetables, dairy products, and articles of domestic manufacture, in the hall; the ploughing match; the address; the spading match; the dinner; and last, but important, the social enjoyments and the pleasing moral influences of the occasion.

The horses exhibited were few, but some were of excellent qualities. The working oxen were good; some fine samples of Jerseys and of Devons were exhibited. The arrangements for the exhibition of stock were admirable. Old Essex holds together in one society, and consequently gets less than her *pro rata* allowance of the public money; yet such is the liberality of her citizens that she seems to be in no want of funds. Praise is due.

In the hall, the exhibition of fruits and vegetables was fine; that of apples was first rate; of pears, good; of garden vegetables and flowers, highly creditable to the farmers and people of Essex. The dairy products were few, consisting of a little butter and no cheese, the former being of good quality, but not extra. A few samples of boots and shoes, and some very ingenious specimens of needle work, were on exhibition. Essentially, however, the mechanical skill of the county was unrepresented.

The ploughing match was in a stony old pasture, ground well adapted to test the skill of the workmen, but such as rendered a just discrimination of comparative merits impossible. The spading match was between seven Irishmen, each spading sixty feet of land, the time allotted being seven minutes. The game was disconcerted by the press of the multitude, but showed one thing at least, that the plough is the better instru-

ment for inverting and pulverizing the soil. If six of these stout Irishmen had hitched themselves to a good plough, and the seventh had held it, they would have done the work quicker and better.

Of the address by Dr. Nichols, of Haverhill, I will only remark that it was of such a character as to show very clearly, that, as Essex county has not for many years been outside of her own limits for an orator, she will not have occasion to do so for many years to come. There must be more good things where that came from.

The dinner is said to have been all very well, and the after entertainment excellent, for which the company were indebted to Rev. Mr. King, Hon. Simon Brown, Mr. Tenny, of Vermont, Mr. Coffin, of Boston, and others. Every thing passed off in a way adapted to impress a stranger favorably with regard to the social feelings and moral character of the people of Essex. No immorality was noticed, unless it be one to compel an ordinary yoke of cattle to take up a steep hill, and hold down the same, four tons on a cart. Your delegate is of opinion that oxen will make their working qualities quite as discernible under reasonable as under severe demands.

J. A. Nash.

MIDDLESEX.

By appointment of the Board, the subscriber attended the annual exhibition of the Middlesex County Agricultural Society, at Concord, on the 27th of September, which was held on the grounds of the Society, comprising about six acres, on which they have erected a one-story building, one hundred by fifty feet, the whole cost to the Society being about three thousand dollars. The usual attractions of the occasion, favored by pleasant weather, brought together a large concourse of people.

There were but few articles of manufacture, some fancy work, &c., but none that demand particular attention.

The exhibition of fruit was large, embracing many rare and choice varieties. The Concord grape appeared in great perfection ; the display was pleasing and satisfactory.

Of vegetables the supply was large, almost every variety in great perfection; the varieties and excellence of the potato were worthy of great praise and added much to the show; of butter and cheese there were none worthy of notice.

The match for ploughing was warmly contested by sixteen teams, more than half of which were horse. The work was fairly done; but there seemed to be more effort to do quickly than to do it thoroughly. The teamsters urged their teams more loudly and used their whips more freely than became expert hands in their business.

The cattle were not very numerous,—a few blood cattle and some excellent milch cows, belonging to Asa G. Sheldon, Esq., equal, if not better, than the best we have seen. Mr. Sheldon has given particular attention to the cow, not as a breeder, but in choosing from the droves from other States, his eye is one of the best. His judgment has been proved by his success.

There was a good display of horses and colts, some of which were of much beauty and promise. The high price this kind of stock commands has induced much attention to the raising of colts in the eastern part of our State. We were received as the delegate of the Board, by the President and members of the Society, with much kindness and courtesy. Every attention for our comfort and accommodation was given that could be desired.

The show, on the whole, did not meet our expectations. We anticipated a large display of fine, well-bred animals, and every department filled in a manner becoming the venerated age, wealth and local advantages the Society enjoys. More attention is probably paid to milk, for sale, within the bounds of this Society, than any other in the Commonwealth; but where there is a good, ready market for the products of the soil, there must be thrift and improvement, and they cannot fail to have the means to fill every department of their annual exhibition more completely than others not so favored. We were inclined to the opinion, that there is a lack of public spirit among the owners of good animals that accounts for the small number of well-bred animals on the occasion. A good exhibition cannot be got up in a community that is not disposed to make some sacrifices to the public good, where remuneration by premium is the principal or only motive to contribute. A narrow, money-

making spirit will defeat all the generous purposes of the association for the public good.

Our annual shows have become very popular with all classes, and bring out large masses to enjoy the pleasures of the "farmer's holiday." It is the duty of those who manage and control these great gatherings to guard against every thing that tends to vitiate the moral sense or encourage practices that detract from the useful objects of life.

The order and decorum hitherto observed on these occasions will be a fact in history of pleasing example. What shall be in the future depends much upon the character given them by the present managers. The purchase of grounds suitable and sufficient for all the purposes of the Society, when properly enclosed, places the whole assemblage more completely under the control of the managers than the most stringent laws would otherwise effect. It is a matter of serious consideration, what the ultimate effect upon the taste and habits of posterity will be of the construction of riding courses, now becoming fashionable, around the grounds. They will be sources of pleasure and attraction to the amateur horse-feeling now prevailing among us. They are, must and will be used for racing, rather than for testing the qualities of the horse most valuable to the farming and productive labor of the community. It is a change with which all seemed pleased. It gives us pleasure, and puts money in the treasury of the Society. All seems to go well now, and "all is well that ends well."

I cannot conclude without a word upon the closing part of the exhibition. The dinner was grand. Every dish was fit for an alderman, and they were numerous enough for a whole city government. The most fastidious epicure must have been more than satisfied.

At the close of the feast we had, by way of dessert, speeches from several of our most eminent citizens, which gave much pleasure by their sprightly wit and humor. All were made joyful and happy. The occasion was much indebted to the worthy President, Gen. Chandler, who performed all his duties with his wonted grace and dignity.

SETH SPRAGUE.

MIDDLESEX SOUTH.

In accordance with the appointment of the Board of Agriculture, I attended the Cattle Fair of the Middlesex South Agricultural Society, at Framingham, on the 19th of September, 1855.

The Society is in its infancy, having been chartered in 1853, this being its third Fair.

Considering the time they have been in operation, they have accomplished much; and one thing, of vital importance in any undertaking, they seem to have enlisted the energies of all the people, male and female, to render their exhibition attractive and useful.

They have obtained about six acres of land, well located, and enclosed it with a substantial fence, on which was erected a tent for the exhibition of fruits, vegetables, and various specimens of useful and fancy articles of female genius, bread, butter, honey and jellies,—in fact, all the little luxuries, together with the substantials, which evince a united effort to make up an exhibition worthy of themselves, and a full compensation to all who might, at almost any sacrifice, participate in the interests of the occasion.

In the vegetable and root department it is not necessary to name the varieties, for they were all there, tastefully arranged, in abundance, and of fine quality. The State of Maine potato there, as at other shows, was the favorite,—exhibited by Mr. Lewis, who had a very large collection of choice specimens, embracing some twenty varieties of other vegetables.

The cattle pens were arranged within the enclosure, and well filled by cattle of the Jersey, Ayrshire, Devon and Durham breeds, with grade stocks of various qualities. None were noticed of very superior merit in their class, though good specimens were numerous.

The President of the Society, Mr. Buckminster, brought upon the field for exhibition, a herd of Devons, of different sizes and ages, from one to eight or ten years old, some twenty-five head. They were not in the best condition; but some of them were good specimens of this stock, which is in high

repute among some of the cattle growers in New England, especially for matched teams of oxen.

The swine department was well supplied, and the show was no failure. Some very fine Suffolks were exhibited by Mr. Haven, and also by Mr. Lewis, of Framingham. They exhibited breeding sows, boars and pigs, from four to nine months old, of the same stock; their superiors can seldom be found, if early maturity is the object sought for. There were also grade pigs that may be made to carry large weight.

There were two flocks of sheep shown; one lot of full blood South Downs, and one of grade Leicesters. They are worthy of a fair trial where sheep husbandry is to be encouraged. They were exhibited by the Messrs. Lewis, of Framingham; and if they propose to turn a portion of their attention to the growing of mutton and wool, I think their experiment will prove successful.

The poultry was of good quality, and the competitors had the fancy varieties and the grades, from Shanghae to the bantam. There were also geese and ducks of the several grades, and turkeys, white and black.

The drawing and testing the teams as to training, &c., were within the enclosure, upon a moderate elevation, upon carts; and the object was not so much to see how heavy a load the teams could draw, but rather how near they could be driven to certain monuments, without touching, and also how perfectly they could be made to turn and back the load.

The chairman of the committee first drove a team in the presence of the competitors, showing a specimen of the operations the committee would expect from each teamster,—a mode of trial far more useful than simply a trial of strength. It was to me a novel experiment. I would commend its adoption by other societies. There were horse as well as ox teams entered for draught, all of which were tested by the foregoing rules.

The ploughing was upon a level field of Mr. Lewis'—a mellow, sandy loam. Fourteen teams were upon the ground at the time appointed; about half were horse teams, one or two teams of a pair of oxen and a horse, and the balance double ox teams. The ploughs were mostly double Michigan, Prouty & Mears', No. 85. Most of the ploughing was nine inches deep, each team ploughing one-sixth of an acre. It proved hard

work. Few, if any, of the teams of horses would have continued the work through the day at the required depth. The work was well done, and the surface left in fine condition to receive a cultivated crop.

The display of horses was not as large nor as superior as are sometimes found at other county shows. Several young horses were driven around the grounds, that showed good training, and there were some promising colts in the pens, with and without their dams. Two stallion horses only were noticed,— one, a gray of fair size and good proportions, pedigree not known; the other, a black, rather small size, but fine, moved well, and is said to be fast; belonging to Mr. Lewis, of Framingham, and sired by old Black Hawk.

The horses could not be shown to advantage on the ground crowded by the pens, tent, teams and spectators, as no track has as yet been graded; and I find the question is exciting interest, whether the trial of horses at shows ought to be continued.

The raising of horses has always been an object of interest, and that interest is not abating. The man of wealth and fancy, as well as the farmer, are in it, and wherever civilization shall congregate the horse will be in request. The exhibitions of State and county fairs all show that it is a portion of husbandry, even in those localities where the rearing is most costly. So long as it is patronized, why not provide for a reasonable display of this portion of our products? To do it, opportunity should be afforded to try them in all the trainings required for man's safety, convenience and comfort, and for the benefit of the farmer who offers them for sale.

It does not necessarily follow that this is to be a trial of speed, any more than the trial of oxen is simply a trial of strength. Let the speed be limited to a mile in five or six minutes; for, so far as my experience goes, the farmer, the rearer of colts, rarely discovers a speed of 2.40. That gait is the result of training, after the first sale, and it may be doubted whether the severe training is, on the whole, a money-making business.

Let the experiment be tried of discouraging horse gambling and excessive cruelty, by permitting fair competition of action, spirit, training and docility, under such circumstances and such

restrictions in speed and strength, as are required in the ordinary occupations the horse is designed for.

After viewing all the interesting objects presented at the show, in the afternoon of the second day, the Society, with ladies and invited guests, some seven hundred individuals were seated around the festive board, under a tent within the enclosure, supplied bountifully from the shambles, the garden and the orchard, all well served up, and after reasonably supplying their appetites with the good things, their attention was immediately called to an address from Mr. Huntington, of Cambridge, a production that would be a treasure, if duly examined and lived up to by every family in our land. At its close, short addresses were made by Lieut. Gov. Brown, who is always ready to give useful instruction, C. L. Flint, Esq., the able Secretary of the Board of Agriculture, Harvey Dodge, Esq., of Sutton, and others. In the midst of which, the railroad whistle summoned us to the cars, understanding that all the reports of the committees in awarding premiums were to be read and disposed of before leaving the festive board.

I am not prepared to say that the order of arrangements in having the address at the table is not a judicious one. Sure I am that such an address as was listened to there, was worth more to every one who indulged the privilege, than the cost of a ticket to the banquet.

I should do injustice to my feelings, if I failed, in closing, to express my obligations to the citizens generally, to the officers of the Society, and particularly to the president, Mr. Buckminster, the chief marshal, Mr. Train, and the Messrs. Lewis, for their hospitality and sacrifices to render my stay at the fair pleasant.

Moses Newell.

MIDDLESEX NORTH.

In the absence of any delegate from the Board of Agriculture, appointed to attend the exhibition of the Middlesex North Agricultural Society, held at Chelmsford, September 17th, I

have thought it proper to make such a report to the Board as may give the necessary information in reference to it.

As the Society was incorporated at a very late period of the last session of the legislature, a short time only was afforded after the organization was completed, to raise the necessary funds, and to make such preparations as would give efficiency to the exhibition. Notwithstanding the difficulties which presented themselves, the exhibition proved to be of a character to gratify those interested in the society, and to afford the promise of much future benefit.

The display of fruit was very fine, and the great variety and beauty of the apples can rarely be excelled in any portion of the State. The peculiar character of the soil in the northern portion of Middlesex county, have, perhaps, turned the attention of the farmers residing there to this particular branch of agriculture, as that likely to return to them the surest and largest profit which they can hope to realize from their labors, upon land naturally rough and sterile, and many have thus become deeply interested, not only in the practical details of fruit growing, but also in the more perfect and scientific prosecution of the subject, and the consequences have been a more correct nomenclature, preventing the same fruit from exhibition under a variety of names, and the rejection of many varieties which have not, upon trial, been proved to be of the first value.

The exhibition of vegetables was respectable in variety and quality, but not of such marked excellence as is sometimes seen, or as may be looked for hereafter.

The display of farm stock was not one calling for special commendation. Some fine cattle were presented; but it must be borne in mind that the section of country included within the limits of the society, is not, for the most part, a good grazing country, and before it would be consonant with good economy for the farmers in North Middlesex to pay the high prices demanded for the best foreign breeds of cattle, some more economical method of feeding must be generally adopted than is now in use. Very few animals are now pastured in this section which do not find it necessary to labor as hard, and as many hours per day for their support as do the farmers who own them; and the returns from animals requiring high feeding,

would, in the present condition of the pastures, yield a far less proportional profit than the poorer but more hardy breeds.

Another reason operating against a superior display of neat stock is, that the attention of the farmers in the several towns from which the society is formed, is, in a high degree, turned to the production of milk for the market, on which account they have, as a general thing, purchased their cows from the stock markets, instead of rearing and improving the best breeds, which will, without doubt, eventually be found the best economy.

The show of bread and butter was very creditable, and the specimens of the latter article were of a character to compare favorably with any other in the State; and it is becoming a general impression among the farmers, that the dairy will yield a better profit at present prices than the milk market. The display upon this occasion has established the fact that the ladies of North Middlesex need fear no competition in their own markets, whenever their attention is given to the dairy.

As a whole, the influence of this exhibition will be widely and beneficially felt, and will serve to spread over a far wider surface, the renewed interest in the subject of agricultural improvement, which had already been awakened by the exhibitions of the Chelmsford Farmers' and Mechanics' Association, in the adjoining towns.

JOHN C. BARTLETT.

WORCESTER COUNTY.

The annual exhibition and cattle show of the Worcester Agricultural Society was held in the city of Worcester, on the 26th and 27th of September. The days were both favorable. The ploughing match, the exhibition of cattle, and the drawing of oxen came off on the first day.

The ploughing match was one of deep interest, and all present seemed to participate in the occasion with great pleasure. There were eight entries of ox teams with two cattle, and five

with four each, and one span of horses. The competitors were all animated, and it was truly an interesting occasion.

There were eighteen yoke of oxen, for the most part, well matched for color and strength. Some were large and well developed, being a mixture of Durham and Native; in others the Devon blood prevailed, and they were handsome and spry. All were well equipped with yokes and good ploughs of different models. The double swivel or side hill, the double Michigan, Ruggles, Nourse & Mason's deep tiller and Eagle, Nos. 31 and 75, Prouty & Mears' Michigan, No. 85, Robinson's, of New Hampshire, all claiming to be superior ploughs. Fourteen able bodied men stood ready to try their skill in one of the most important and interesting departments of Agriculture. The word was given, the competitors were at their post, grasping the handles of the plough, with a steady hand commenced their task, the ox teams, for the most part, showed that they had skilful masters and were now ready to perform their bidding. The ploughmen showed great skill, which must have been acquired by practice and strict observation.

The ploughs all did good work. There was one which attracted my attention as superior to any other plough for the purpose for which it was made. It was the double swivel, which combines the side hill with the Michigan, made by the enterprising firm of Ruggles, Nourse & Mason. It was drawn by four cattle, cutting a furrow twelve inches wide and ten inches deep. This plough is admirably calculated where there is a deep soil. It stirs the soil thoroughly, and leaves the surface in good condition for working. There was also a plough called the deep tiller, made by the same firm. They did the work well, cutting a furrow from ten to fourteen inches wide, and from seven to ten inches deep, stirring the soil thoroughly.

I also noticed a beautiful plough made by Prouty & Mears, No. 85. It cut a furrow twelve inches wide and ten inches deep, and did the work well.

These ploughs were all superior in their mechanical proportions, turning a clean furrow, deep or more shallow, narrow or wide, easily gauged to whatever depth the ploughman may desire. The double-swivel plough is now a favorite with many of our farmers, and I should think it would be more generally

introduced on rolling lands. The ploughing can be done more uniformly and without leaving a dead furrow.

So great has been the improvement in the plough, for the last quarter of a century, that it would seem as if inventive genius would be exhausted and the plough perfected. Great praise is due to our mechanics for their superior ploughs and other implements of husbandry.

I was very much pleased with the exhibition of oxen in the drawing and backing of loads. The object was not to see how large a load they could start; but it was to take a good load, (about two tons,) and walk off actively, showing perfect obedience to their drivers, backing with the same facility as drawing, —this was done by most of the competitors. We should encourage the training of oxen to perfect obedience, for they are thereby rendered more valuable and useful.

The exhibition of cattle was large. There were some very superior imported cattle on the ground, of Durhams, Devons, Ayrshires and Jerseys. The largest oxen were the native and cross with Durham. This is considered a good cross, both for service and beef. There were some very handsome oxen—a cross of Devon and Durham. The Devon cattle were not large, but handsome and active.

The Ayrshire oxen were rather small. I should not think this breed of cattle as well calculated for oxen as for the dairy.

The Jersey cattle present, consisting of a bull and a few cows, were not a fair specimen of that breed. The Jersey cows are highly spoken of for milk; but there is nothing in their appearance that is prepossessing.

There were thirty-two cows offered for premium. The cross of Durham and native breeds were the most noble looking on the ground, with one or two exceptions. So far as my experience extends, the cross of Durham with the native produces the best cows for milk. The Devon cows were small, but some were very handsome and have good points for milk.

The Ayrshire cows were of fair size, and the general appearance was good. Hon. John Brooks exhibited an Ayrshire cow, a very superior one, with the general appearance of a great milker. He also exhibited a five-year-old Hereford cow, full blood, a most perfect animal. She had a calf by her side

seven months old, very promising. This cow and calf were purchased for the State farm.

The young stock, for the most part, was promising. Moses Smith, of Hardwick, exhibited a Durham and Hereford bull, a very perfect animal, weighing seventeen hundred pounds.

Nathaniel Dodge entered a bull, said to be a Devon, which was the most perfect bull of the kind on the ground.

Charles B. Demond exhibited a Durham bull of the first order; weight two thousand pounds.

The farmers of Worcester county, are fully equal to those of their neighboring counties for raising good cattle. They have more foreign blood than any of the western counties.

The show of sheep was very small, and not worthy of comment. The swine were very superior, being a cross of Suffolk, which is the best cross now extant.

The second day there was a large collection of people to see the exhibition of horses. There was a fine display of horses, almost every variety being represented; some of them beautifully formed, with majestic appearance, while others were more serviceable for the farm. On the whole, we seldom see a better collection of horses.

In the Hall there was a good display of butter and cheese, for which so many towns in Worcester county are noted. This is a deparment of the farm upon which great improvement is yet to be made. There are great inducements offered to the farmer, by a good and ready market for the great luxury of good butter and cheese. Very few domestic articles.

I cannot refrain from noticing the exhibition at the Horticultural Hall. It has never been my good fortune to witness so large and beautiful a variety of fruits, flowers and vegetables. There was almost every variety of apples and pears. The flowers themselves were beautiful, but their beauties were greatly heightened by their tasteful arrangement. They were, of course, presented by the ladies, to whom is committed the cultivation of delicate and beautiful things.

The great attraction in the Hall was the water lily, Victoria Regia, in flower. This novel and famous plant has created much interest in America. The growth of its leaves is very rapid. It is related that, in its native clime, a single leaf is

sufficiently large and strong to bear the weight of a man. The flower is of the purest white.

The closing scene of this most interesting exhibition and fair was at the dinner table, in the hall owned by the Society. The tables were spread with all of the choice things that make up a superior dinner. Never have I sat down to an agricultural dinner so well served up, with so much taste, and so teeming with all the bounties of a goodly land as here. Tables were surrounded with the yeomanry of the county, partaking of the fruits of their own toil,—men and women of striking intelligence and warm hearts, celebrating their yearly jubilee in this most becoming manner, giving character to their profession, and friendly greetings over this sumptuous board.

After the good dinner was partaken of, under the most favorable and joyful circumstances, the Hon. John Brooks, the President of the Society, introduced William Brigham, Esq., to the audience, as the orator of the occasion, and he delivered a chaste, forcible and practical address, doing ample justice to his various topics. After this the President made some pertinent remarks touching the great interests of agriculture. He then introduced Gov. Lincoln, who favored us with very appropriate remarks touching the interest of the Society and of agriculture. Hon. Charles Hudson was called upon, who responded. He is always in his philosophy clear, and in his illustrations acceptable to any audience. Mr. Sprague, of the Board of Agriculture, was also called upon, and, with his usual good sense, much interested the audience. Our friend, the Hon. Secretary of the Board, was among the number who, sparkling with wit and timely remarks, helped to fill up the hour with interest and profit.

Then came off the most excellent reports of the committees, and awarding of premiums, which closed up this most interesting festival.

JUSTUS TOWER.

WORCESTER NORTH.

This vigorous and flourishing Society held its third annual exhibtion in Fitchburg, on the 19th of September last, and notwithstanding the weather in the morning was rather unpropitious, a very large concourse of people were in attendance.

I reached the town at about half past nine o'clock, too late to witness the ploughing match, which took place at nine o'clock, A. M., on a lot of ground in the south part of the town, and was said to have been well contested, by thirteen single and four double teams. The trial of draught horses and working oxen took place at half past ten o'clock, in which twenty-four ox and nine horse teams engaged. Great interest was manifested in this part of the exhibition, and the manner in which the work was done gave satisfactory evidence that the teams were well disciplined and the drivers skilful.

The cattle pens were conveniently located upon the public square. They were numerous, neatly constructed, and well filled, principally with native stock of good appearance; but I noticed few of any great merit.

The array of working oxen was quite large, embracing several town teams. They were in capital condition, clean, sleek and powerful looking animals. A pair of fat oxen, exhibited by Levi Heywood, of Gardner, weighed 4,300 lbs.

Of swine and sheep the show was not extensive, but embraced some fine animals of both classes.

There was present a goodly number of horses and colts; but, as I had no opportunity of seeing them in motion, could not as well judge of their entire merits. Some of the colts were of uncommon beauty.

The exhibition of fruits, together with specimens of needlework, fancy articles, &c., contributed by the ladies, was held in the spacious Town Hall, which was well filled. The specimens of fruit consisted principally of apples, very beautiful in appearance, and of many rare and valuable varieties, showing that much attention is there given to the cultivation of that most valuable of our fruits. Of pears and peaches, the show was not

large, but the specimens of both were of fine quality, and gave evidence of good cultivation.

The products of the dairy exhibited, fell short only in quantity. The quality of several lots of butter and cheese was excellent.

Garden and field products, mechanical articles, &c., were exhibited in the lower Town Hall, which is also spacious, and was well filled. The display of potatoes, squashes, &c., was extensive and very fine. Other field and garden products were also well represented. The display of mechanical articles was varied and interesting. This Hall, as well as the upper one, was thronged with visitors throughout the day, all of whom seemed interested and highly gratified.

At twelve o'clock a procession was formed, and marched to the new Baptist Church, where an interesting Address was delivered by the Hon. N. P. Banks, Jr., in which the relation of agriculture to the other industrial pursuits of the United States was illustrated in a forcible manner.

After the services in the church were concluded, the procession was again formed, and repaired to the Fitchburg Hotel, where an excellent dinner had been provided for about three hundred persons. The seats were all filled, many ladies favoring the company with their presence. The bounties of the table having been duly attended to, brief speeches were made by his Excellency Gov. Gardner, Hon. Chas. Hudson and S. Chandler, of Lexington, Hon. N. P. Banks, of Waltham, O. A. Brewster, Esq., of Boston, Hon. Alexander DeWitt, of Worcester, and Dr. Reynolds, of Concord. The occasion was one of much pleasure to all present.

In conclusion, I deem it but just to remark, that the affairs of this Society seem to be managed with great skill and good judgment. All the arrangements for the occasion were of the most satisfactory character. Every thing was done at the proper season, and in good order.

S. Chandler.

HAMPSHIRE, FRANKLIN, AND HAMPDEN.

By direction of the Board, the undersigned attended the Cattle Fair of the Hampshire, Franklin and Hampden Agricultural Society, at Northampton, on the tenth and eleventh of October. They were beautiful and sunny autumnal days, and the people, as they assembled in large numbers, in early morning, seemed joyous and happy. The cattle exhibited were not numerous, but good. J. B. Lyman, of Huntington, presented a three-year-old Hereford bull, weighing nineteen hundred pounds, said to be pure blood. He, however, presented some marks of want of purity of breed; but was a good animal, and will render great service towards the improvement of the stock of his neighborhood. This bull is the sire of a fine bull calf, nine months old, weighing eight hundred and fifty pounds, exhibited by Joseph W. Powers, of Southampton. There was a grade Hereford bull, one year old, owned by Ahira Lyman, of Northampton. This bull handled well, was somewhat narrow in the loin, but, on the whole, was a good animal. Mr. Lyman exhibited four grade Hereford steers, two years old, which give great promise of this breed for the yoke.

Otis Turner had on the grounds some fine grade Durham steers and heifers. Cephas May presented a yoke of three-year-old Durham steers, weighing thirty-one hundred pounds, large, but long in the legs.

There were other animals in the pens, good in their class. Of oxen, there were two teams on the grounds, one from South Hadley, of twenty yoke, and one from Easthampton, of twenty-one yoke, all large cattle. Among them was noticed a pair of three-year-old steers, owned by Julius F. Clark, of Easthampton, weighing twenty-seven hundred pounds. A line of ten yoke of fat oxen was exhibited from Westfield, which cannot be equalled in any part of the State, unless it be in the valley of the Connecticut. One pair, owned by George Taylor, five years old, weighed four thousand seven hundred pounds; one pair, belonging to Mr. Buck, weighed five thousand pounds. The whole ten yoke were of superior quality, and attracted universal attention.

But few milch cows were presented; none of any marked distinction. The want of competition for the liberal premium offered by the Massachusetts Society for Promoting Agriculture, for the best dairy of six cows, is very much to be regretted. Of what avail is it to offer premiums, if farmers will not compete for them?

Of sheep, but a small number were exhibited; none of any note, except four Oxfordshire lambs, by Lawrence Smith, of Middlefield. Of swine, some few specimens were shown; none of marked excellence. In the drawing match there were thirteen trials with cart and load of thirty-three hundred and sixty pounds. The drawing was passable, but the backing was decidedly bad. The oxen manifested great want of training and subjection to their drivers. In the ploughing match were fourteen competitors,—one ox and thirteen horse teams, and one double plough. The work was well done and in good time. The advantage of the double plough was manifest, it leaving the soil lighter and in much better condition for the crop than the single plough. The horse show was not large. The horses exhibited were generally good, but none of much note in their class. In the fruit department there was a large display of more than five hundred plates. One gentleman, W. A. Arnold, exhibited fifty varieties of apples. William Clark, Edward Clark and Benjamin Barrett presented many varieties of fine apples. Mrs. Woodward had some beautiful specimens of grapes upon the table. J. W. Wilson, the spirited secretary of the society, did himself and the show credit by exhibiting the best and largest variety of pears. Of family bread there was a grand show, proving that the Connecticut Valley is not deficient in good housewives, or of good husbands to supply them with ovenwood. In connection with bread we noticed a beautiful display of butter and cheese. In the vegetable department was exhibited the usual variety of potatoes, pumpkins, squashes, cabbages, beets, carrots, parsnips and beans,—doing credit both to the cultivator and to the soil in which they were grown. Among the domestic manufactures was a great variety of carpets, bed spreads, overlaid with fancy figures, in bright colors, evincing the industry of the ladies. Of fancy articles there were many, and among them a case of wax work, by Mrs. Lavake.

The church exercises were opened with an overture upon the

organ, followed by prayer from Rev. Mr. Hall; after which, the secretary introduced the orator of the day, Solon Robinson. He addressed the audience for an hour, earnestly endeavoring to impress upon farmers the necessity of improvement in the science and practice of agriculture. Your delegate was received by the officers of the society with great courtesy, and the respect shown the Board of Agriculture, through him, was highly gratifying.

JOHN BROOKS.

HAMPSHIRE.

The Hampshire County Agricultural Society held its annual show at Amherst, on Wednesday and Thursday, October 10th and 11th. The weather was pleasant, and great numbers from all parts of the county attended, and what was especially gratifying, the wives and daughters, not only of the farmers, but of the mechanics, merchants, lawyers, physicians, clergymen and literary men were there, and enjoying the festivities of the occasion with as much relish as those who had the fat oxen and noble horses, or those who made the butter and cheese. Like most of the western societies, in some respects their exhibition was better than we can show in the eastern part of the State. In the exhibition of fruits, they are far behind Essex, Middlesex, Norfolk and Worcester counties; but in the articles of butter and cheese, they entirely outstrip all these counties, with the exception, perhaps, of Worcester.

There can be no fair comparison between their working cattle and ours, as they raise their own, often selling the best to be taken away, while most of ours are selected from the finest which can be found in the western part of this State, and from New Hampshire and Vermont. So it is in a considerable degree with the horses—though in the latter they are able, at any time, to make a fine display of young animals. There were some very fine cattle presented by Messrs. Alfred Baker, of Amherst, Horace Russell, of North Hadley, Frary Field, of Leverett, H. N. Rust, of South Deerfield, Luke Sweetser, of

Amherst, H. Hunt, of New Salem, A. J. Cadwell, Hubbard Graves and Austin Russell, of Sunderland, O. Richardson, of Granby, and others whose names I did not obtain. The town of Leverett sent in a string of working oxen numbering fifty-three yoke, and Hadley, twenty-four yoke, which were a credit to their towns; and these made quite an attractive feature of the show. Pigs and poultry were not numerous, or in any way remarkable; but the show of sheep was fine, and included choice varieties.

The exhibition of fruits was creditable, there being fine specimens of most of the common varieties. But fruit-raising in that part of the State has not been entered into much, as a matter of business; so that if our friends wish to see a display of fine fruits, and in great variety, they must visit some of our exhibitions nearer the sea-board, where interest, as well as taste, has prompted the cultivator to reach the highest perfection in the art.

The butter and cheese presented were in quite large quantities and of the best quality. We have seen nothing to equal them, except at the Berkshire Show at Pittsfield.

The address was by Charles L. Flint, Esq., Secretary of the State Board of Agriculture.

During the delivery of the address the church was crowded, and the close attention of the audience evinced the satisfaction with which it was received.

The highest gratification which we found was not in the noble horses, fat beeves, milch kine, pigs, poultry, or vegetables, but in the expression of a sentiment fast increasing in the rural population. A great many people have discarded the belief that labor is an evil, and that there is no enjoyment in the occupation that earns the bread we eat and the delightful homes we occupy. After looking at all the departments of the exhibition, we were so fortunate as to be introduced to several of the women of Hampshire county, and in their expressions of attachment to rural life, and of the happy influences of rural occupations upon themselves and their children, we found a source of gratification far exceeding that which any other matter afforded. They feel that in the calm and rational pursuits of agriculture and its kindred branches, horticulture and arboriculture, there is less excitement of the passions, less tempta-

tion to lure from the paths of virtue, and a constantly ennobling influence that lifts the soul through nature, up to nature's God. That God is daguerreotyped, as it were, before us all; that we see His wisdom and love in the bending grass, the trembling leaf, the sparkling dew, and in a thousand wonderful operations constantly carried on by His superintending care, and which are ever present to him who cultivates the soil. That there are lessons of trust, of confidence, of submission, to be found in the garden and field in many different forms; that wisdom may be found in every flower that blooms, or insect that lives; that there are

> ——— "books in the running brooks,
> Sermons in stones, and good in every thing."

Such sentiments are gaining ground, and as they are received, the farm-house will become embellished with books, with shade trees, with climbing plants and flowers, and contented hearts, and the home of the farmer become the happiest and the most independent of all in our land.

At the dinner table an unusual number of professional and literary men were present. His Excellency the Governor spoke, and his earnest and hearty expressions gave evidence of the deep interest he felt in the important and ennobling occupation of the farmer. Dr. Stearns, President of Amherst College, Professor Clark, the Rev. Dr. Woodbridge, and your delegate, and several other gentlemen, addressed the multitude which filled the large hall to its utmost capacity, and where all were heartily received and cordially welcomed in a brief and pertinent address by Mr. Dickinson, the President of the Society.

But one among the leading men in the noble art, Prof. J. A. Nash, of Amherst, did not mingle his voice with others, on this festive occasion, being called away by the death of an aged relative.

The social influences of such a gathering, aside from all questions of a pecuniary character, must have an important bearing upon the homes of our people. They unite us more closely in the common interests of all, and beget an acquaintance among many, which often results in the happiest associations for life. These institutions, then, are not the mere mer-

cenary matters of common trade; they have a higher and nobler aim, which they are fast accomplishing—that of elevating the rural population in social position, in virtue and intelligence, and consequently in power over the destinies of this great nation. They have already driven out the coarser rural fair of an earlier day, the offspring of the old country, where games and racing, and all their accompaniments, made up the spirit of the day; and they have, in a great measure, supplanted that military spirit which existed and flourished, because men could find no other outlet for that recreation which our natures imperatively demand.

The manner in which your delegate was received and entertained, shows the appreciation in which the Board is held. Nothing was left undone on the part of officers and members to make his visit among their people one of the most happy character.

So the Hampshire Show was a successful one, because it was constructed upon principles which will make men better and happier—a rational *Holiday*, which should be kept pure from all distracting influences of whatever name.

SIMON BROWN.

BERKSHIRE.

The forty-fifth anniversary of the Berkshire Agricultural Society took place at Pittsfield, on the 3d, 4th and 5th days of October. All the exhibitions, and all the exercises of the whole three days, including the ball on the evening of the third day, were on the grounds of the society.

The show this year was the first under important changes, and new arrangements of the society. They had purchased and enclosed thirty acres of land, erected yards and stables, laid out and graded a fine trotting course, introduced water in abundance, and constructed a building in the form of a T, each part ninety feet in length, and about fifty feet wide. On the roof is a deck with balustrades, affording space for some ten or fifteen

hundred persons, from which position the trotting, the equestrian performances by the ladies, the foot-races, the ploughing, drawing, and all other out-of-door exercises could be seen. So, from this spot, was one of the loveliest panoramas ever presented to the eye. Here the Pontoosuc comes ambling along through the narrow valleys, turning wheels and watering meadows as it flows, and giving examples of animated industry in its babbling course. There flows the Housatonic, enlarged and strengthened by the contributions of the Pontoosuc, and swelling out into the magnitude of a river, gladdening the manufacturer's as well as the farmer's hopes, and fertilizing the waiting intervals, green slopes and shady banks, as it winds along. Yonder are the hills on every side. On the north, old Greylock lifts its hoary head, still venerable and august, but young as when the oldest saw it first, dashing the battling elements from its sides, as the lion shakes the night drops from his impervious mane. There are the hills which circumscribe and mark out the amphitheatre of which these grounds are the centre—their sides covered with the deep forest, or dotted with rock maples, black birch, or groups of hemlock, perhaps the most beautiful evergreen of our climate, as well as among the most symmetrical and elegant of trees. Down the sides of these "crystal hills" pour limpid streams, where sheep and milch cows slake their thirst, and, checked in their course, with gathered strength they turn the wheels that grind the corn, or saw the logs that they have nourished many years. And, autumn frosts having touched with icy fingers the trembling leaves, they gleamed in colors of every hue, golden and scarlet, purple and orange, each vieing in brilliancy with the other, and forming a richness of shade and coloring never imitated by man, and probably unequalled in any other clime. Nearer, shot up the white spires of the village churches, while the rich tones of a bell, or the busy hum of industry, occasionally met the ear. Such is but a feeble portraiture of the spot selected by our Berkshire friends, upon which annually to gather, with their wives and children, and keep *The Farmer's Festival.* A better selection we have never seen, nor a wiser disposition of all the adjuncts which must surround it.

As will be seen above, this exhibition made the forty-fifth of this time-honored and flourishing society—a society which has

been instrumental in continuing and greatly increasing the fertility of the lovely valleys and the noble hills which are so beautifully planted throughout the county. An intelligent and prosperous farmer remarked, that he had taken the first premiums in nearly every class of the exhibitions, and was happy to say, that he owed whatever of success and skill he had acquired to the encouragements and influences of this society. The condition of the farms, and the *homes* of the farmers, bear evidence of the truthfulness of the remark. But, in point of seniority, the "Old Berkshire" must yield the palm to Middlesex. The "Middlesex Society" was incorporated on the 28th of February, 1803, by the name of the "Western Society of Middlesex Husbandmen." It had existed as an unincorporated association, under the same name, from the year 1794. On the 24th of January, 1820, it was changed by an act of the legislature, to that of the "Society of Middlesex Husbandmen and Manufacturers," and subsequent to that time—as the manufacturers had little to do with it—to "The Middlesex Agricultural Society," which is its present title. It has now two lusty daughters, one on each side of her, which bid fair soon to come up to the full proportions of the mother, and perhaps, look a little more dressy and important than the good old dame herself. But one agricultural society now existing within the Commonwealth takes precedence of the Middlesex by virtue of seniority,—"The Massachusetts Society for Promoting Agriculture,"—which was incorporated in 1792, and whose members were made by the act incorporating the Western Society of Middlesex Husbandmen, honorary members of that corporation, and entitled to be present and vote at its meetings.

Wednesday, the first day of the show, was pleasant; the elements were propitious, the roads were good, and the temperature so genial as to invite even invalids abroad,—and the fair opened with the most flattering prospect. The object of this day was to show all kinds of animals, except horses, that were to be exhibited for premiums, and all manufactured articles, implements and machinery.

The number of neat cattle was not large, or in any way remarkable in appearance, and were all of the common breeds, or with only a slight admixture of foreign blood. Swine were also quite limited in number, and the show of poultry was not large.

The horses tried the track, as also did ladies and gentlemen in easy carriages. The arrangement of fruits, vegetables, harnesses, counterpanes, quilts, embroidery, capes, collars and skirts, went on in the great hall; peddlers made good speeches, selling their whips and words at poverty prices, showmen banged the banjo and stirred up their poor animals with sharp sticks; while the restless cattle lowed for their stanchions and their evening feed at home! So the day waned away. The departing rays fell with their soft beams upon the varied foliage on the hills, lighting for a few lingering moments, nature's grand cathedral, the woods, into a gorgeousness of beauty, far more splendid than the genius of man has, or ever can devise. Light faded, men, women and children departed; the fandango ceased to move, gloom rested on the hills, few sounds were heard, but the measured tread of the tired policeman, as he went his weary rounds, and night was supreme over the late animated scene.

In the language of one of the "fast gentlemen with fast nags," Thursday, the second day, was a "stunner!" The wind, surcharged with a cold, sticky vapor, moved lazily along, clinging to man and beast, like the shirt of Nessus; but the pluck of Old Berkshire was up, and, rain or shine, they were determined to have a good time. So the horses were brought out, and encouraged into some pretty lively paces, while the spectators shivered and took the dismal droppings of about a thousand indigo-colored cotton umbrellas. The great halls were crowded with men, women and children, who examined and commented upon each article about six times over, and then counted the number of boards in the roof and braces in the frame-work of the building, and wondered if it never would be done raining. But before noon it became evident that rain and cold and mud would get the mastery, and drive them home. The horses dropped their ears and hung their heads in sleepy listlessness, and indicated the strongest disposition to "turn tail to the wind." Men's hats and coats looked seedy and old; the borrowed feathers in bonnets hung heavy and meagre, while skirts were wofully bedrabbled, and clung too close to ankles unused to touch the soil. It was a failure. The elements won the race and triumphed in it, leaving every nag behind, drenched, dismal, and discouraged. Then the hotels, bright parlors and inviting sitting-rooms, opened their doors and welcomed tired visitors to

their warm and hospitable precincts, while fitful gusts strewed the ground with leaves or drove the rain against the glass. A darker night than the first brooded over the earth, and the hills and valleys were alike lost in the impenetrable gloom. So the second day closed upon the forty-fifth anniversary of the Old Berkshire society.

But Friday—who says that Friday is always an unlucky day? —Friday morning, bright and early, the sun came flashing over the eastern hills, and sent his warm and cheering beams into every nook of that rich and lovely valley. Up went the mists from the meadows and hill tops, and once more shone the gorgeous dyes on their sides; the cocks crowed and strutted in their harems, with unbounded gusto, and geese and ducks, and pigs and horses, and oxen and calves and sheep, each lent a note so as to render the harmony complete! Children clapped their little hands in delight in view of the ride, and gingerbread and buns, and music and races that were before them, and so the mothers were happy and the fathers glad. The whole world of Berkshire turned out, the gates were thrown open, and the success of the forty-fifth fair became a "fixed fact."

The first exercise was that of ploughing. The bills stated that the teams would start at "nine o'clock, A. M.;" but it was nearly eleven before the chains were straightened. Thirteen teams ploughed, on a gravelly loam, and did the work moderately well. The ploughs used were all single, and one of them had a cast-iron beam. There was but one pair of oxen which exhibited any thing but the most common training, and they were also the finest in proportions, being attentive to the driver's language, strong and quick in their motions. A pair of black and a pair of gray horses were also well matched and well trained. The black pair we afterwards saw attached to a carriage, where they did themselves and driver as much credit as they did with the plough. Six inches in depth and twelve in width were required. The ground was unfavorable in two particulars—it was ridgy and full of pebbles, so that it would be difficult to make handsome work, even with skilful teams and men.

Then came the riding on horseback around the course, by ladies, and a very pleasant and attractive feature it was—and

then the exercises in the great hall. These consisted of excellent music by the Longmeadow band, and an address by the Hon. Julius Rockwell, president of the society. It is a common law in the society, that the president shall continue to act as such two years, and on the retiring year shall deliver the address, and an excellent law it is. He took for his subject, *the thoughts of the young farmer*, and showed, first, that the lessons and habits of early life are never forgotten. Then he spoke of his initiatory steps into the art and mystery of farming, such as yoking and breaking the steers, and other incidents illustrative of the whole;—and of his choice of occupation a little later. He said a thorough training on the farm was *capital* to the young farmer, as education is capital to the doctor, lawyer or clergyman. He spoke of the professions, gave a budget of good reasons for not going West, painted the autumnal scenery of New England in glowing colors, spoke of the resources of the county, recited the bounties of the Commonwealth, then most felicitously married the young farmer to one of the handsome, healthy, well-educated, and intelligent daughters of the New England hills, and closed his address. A brief address by your delegate, and another by Dr. H. D. Childs, formerly Lieutenant-Governor of the Commonwealth, followed, and then the beautiful silver plate, amounting in value to hundreds of dollars, was distributed to the individuals to whom it had been awarded by the various committees. Afterwards there was trotting on the course, and the fair closed, by a grand ball, in the evening, in the great hall on the society's grounds.

The exhibition of fruits and vegetables was meagre; that of butter and cheese was large, and of the finest quality; of domestic manufactures there was a considerable display of carpets, rugs, hosiery and embroidered work, such as collars, skirts, &c. A few loaves of bread only were seen, and that of quite an ordinary appearance.

The exhibition, on the whole, was one of great merit and interest, though, in some respects, deficient. There was an evident want of taste and arrangement in the articles shown in the hall, and of punctuality in the time of commencing the several exercises of the day; while the choice of location, the

construction and arrangement of buildings, the mode of distributing premiums, and the excellent butter and cheese presented, are all worthy the highest commendation.

The moneys received for admission to the grounds were cheerfully paid, amounting to some thousands of dollars, and the farmers and others of the county were apparently gratified with the new arrangements of the society.

In conclusion, I beg to express my belief in the great utility of these associations,—in them as agencies to promote the pecuniary interests of the farmer, to advance him and his family in social position, to encourage scientific investigation, and make the agricultural population that intelligent, thrifty, permanent class upon which our free institutions must always look for strength and perpetuity.

SIMON BROWN.

HOUSATONIC.

The undersigned, agreeably to the appointment of the State Board of Agriculture, attended the Annual Cattle Show and Exhibition of the Housatonic Agricultural Society, held at Great Barrington, on Wednesday and Thursday, the 26th and 27th days of September.

This young society is in a flourishing condition, and already ranks among the first in the State. The present season, through the enterprise of its officers, fifteen acres of land have been added to its grounds; making, in all, thirty acres of beautiful lawn, gradually undulating to the Housatonic River, and commanding a superb view of the justly celebrated Cascade Barn and Villa of David Leavitt, Esq., which, combined with the autumnal scenery of the mountains of Berkshire, and two delightful days, rendered this exhibition highly attractive.

A large variety of fruit, comprising apples, peaches, grapes, plums, &c., shows that no small attention had been paid to Pomology, while the monster pumpkins, (one of which weighed

seventy-four pounds,) and squashes, potatoes, celery, corn, beets, &c., &c., show, that the good people of Berkshire do not intend to live by "bread alone," this winter.

Some fine specimens of needlework, by the ladies, attracted much attention.

A large quantity of butter was exhibited, and, while some few specimens were strictly prime, much was offered which would hardly be considered first rate. This article should meet with more attention in this district, where the pasturage is so good.

A large supply of bread was offered, of excellent quality, much to the credit of the good housewives and daughters. In olden time, the good wife was known by the clean linen of the husband; but, perhaps, in these days of poor Genesee, yeast powder, cream of tartar and saleratus, some of our modern farmers would prefer to have the privilege to judge them by their bread, also.

Twelve yoke of superior cattle were offered. One pair of steers, three and a half years old, weighed thirty-seven hundred pounds, having been principally fatted in the rich clover pastures. Also, quite a number of handsome working oxen.

The show of milch cows was large, and many of them fine animals.

Your delegate was much disappointed at not being able to give the *breed* of some of the fine cattle, there being no cards designating the breed, age, &c., on the animals or pens.

No very fine-bred hogs were offered for premium, although quite a number of ordinary animals were exhibited. More attention might be profitably bestowed on these animals.

Several handsome sheep received premiums. But your committee learned that sheep raising is gradually declining in this county, which, if true, is worth the serious consideration of the grazier, and for him to decide whether the hill pastures can be better employed than raising mutton at the current high prices.

The ploughing match was the first business of the second day. Quite a number of teams engaged, doing the work very well. No double ploughs were used.

The display of horses was unusually large; many superior animals were exhibited. A large part of the day was devoted by the several owners and amateurs to showing them off to the

best advantage, on the fine trotting track. This display was finished by a specimen of female horsemanship, which seemed to be the feat of the day ; and some ten thousand persons pressed eagerly to catch a glimpse of the band of young ladies who contended for the prizes.

The award of premiums was made in silver, in place of money, which is an excellent idea. While money is changing, the silver spoons awarded at the cattle show are held up to the children's children, stimulating them to high effort and industry.

An excellent address was delivered by G. E. Waring, Esq., of New York, which was listened to with much attention.

Wm. G. Lewis.

NORFOLK.

The Seventh Annual Cattle Show and Fair of the Norfolk Agricultural Society, took place at Dedham, on the 25th and 26th days of September last, and is believed to have been one of the most successful exhibitions of this vigorous and flourishing society.

In the halls, the display of vegetables and fruits was remarkably rich, while that of flowers was surpassingly brilliant and beautiful.

On the grounds, there was a fine show of young bulls, a great number of excellent milch cows and heifers, a superior collection of horses, and an assortment of swine and of poultry, which made up in quality what it may have wanted in number.

On the second day of the exhibition, a ploughing match, a spading match, and a trotting match, afforded successive objects of interest and excitement, and were followed by an admirable address, and a most agreeable banquet.

The undersigned deeply regrets that unavoidable circumstances prevented him from being present on the occasion,

agreeably to the appointment of the Board; but he is happy to be the medium of communicating the concurrent testimony of many gratified witnesses.

ROBERT C. WINTHROP.

BOSTON, December 4, 1855.

PLYMOUTH.

The undersigned, having been appointed a delegate to attend the Annual Cattle Show of the Plymouth County Agricultural Society, has attended to that duty.

The Plymouth County Society is one of the oldest in the State, having been formed in the year 1819. A history of the progress of the society, from its formation to the present time, has been furnished me by Mr. Latham, the present secretary. As every thing relating to this "home of the Pilgrims" is interesting to New England people, and as a new era in the affairs of this society, which undoubtedly will have an influence upon the future transactions of others, has transpired, it seems to me to be proper to allude to its progress and present condition at some length. At the time of the organization of the society, the fee for life-membership was fixed at ten dollars, and for yearly members at one dollar. Rev. Morrill Allen, of Bridgewater, was the only person who paid ten dollars. He has always been an active and most useful member of the society, has been its president, and is now surpervisor. He is a practical agriculturist. It appears that only about sixty persons joined the society during the first year, at one dollar each, but the terms of admission were soon altered. The yearly membership was abolished, and the fee for a life-membership was established at five dollars. About two hundred persons joined the society in 1820, and from that time up to 1854, but few persons joined the society annually. Since the formation of the society, five hundred and thirty persons have joined it, three hundred and fifty-three of whom are now living, and two hundred and eighty-three of that number have become members since October, 1854.

The financial affairs of this society appear to have been managed with great prudence and skill. Its fund, created by admission fees and accumulation of interest, amounted, in 1821, to about $1,000; in 1831, to $3,000; in 1840, to $5,500; in 1851, to $8,606; and in 1854, to $9,550. Previous to the present year, the annual exhibitions of fruit, vegetables, products of the dairy, manufactured articles, &c., were held in the Town Hall at Bridgewater, to which, for the last three years, an admission fee of ten cents has been charged, which afforded an income, in 1852, of $248; in 1853, $288; in 1854, $300. For the last ten years the society has paid out in premiums from $400 to $1,000 annually, and its yearly expenses have been from $350 to $450.

For several years past this society has experienced great inconvenience from want of in and out-door space for their exhibitions. The Town Hall was not large enough, and sometimes it was difficult to obtain suitable ground, within convenient distance, for their ploughing match. These considerations, with others, induced the society, in December, 1854, to take measures to procure accommodations of their own on a more extensive scale. They have since purchased, at an expense of little more than $2,600, a tract of land containing about thirty-one acres, admirably adapted to the purpose, upon which to hold their annual exhibitions, ploughing match, &c. The land is about half a mile from the principal village in Bridgewater, one-fourth of a mile from a railroad station, and about four-fifths of its circumference is bounded by Taunton River, which affords sufficient protection without a fence. The remaining part has been enclosed by a close board fence, six and a half feet high, with stone posts. The grounds have been graded, trees set out, wells dug that supply pure water, and a track formed half a mile in length, for the trial of horses; all of which has cost the society about $2,300, exclusive of the cost of the land. The society now contemplates the erection of a large building upon the grounds. When this is done the arrangement will be complete; the society will be possessed of every necessary accommodation for its annual exhibitions, including ploughing match and experimental agriculture. This year the show was held on the third and fourth of the present month, upon the society's own land. Large tents were erected for the occasion. The

admission fees amounted to more than $1,800, and the expenses were about $800, leaving a net profit of $1,000.

This society offers premiums for the best cultivated farms, for reclaimed meadows, for compost manures, (having a regard to the quantity, quality and cost,) for the raising of forest trees, and for experiments in feeding cattle, in addition to those usually offered by agricultural societies, and requires full statements of the mode and cost of each experiment, before awarding the premiums. This involves a necessity for considerable labor to be performed by committees, and care and system on the part of applicants; but must be highly beneficial to the farmers of the county, and is an example which ought to be followed by every society upon which is bestowed the bounty of the State.

On the first day of the exhibition the several committees made their examinations. Twelve teams entered for the ploughing match, and did their work like good farmers. The show of cattle, horses and swine was creditable to the owners and the society. There was evidence that considerable attention had been paid to raising blood stock with good success.

The display of vegetables, manufactures, and fancy articles, was large and good. One would suppose from the show of boots and shoes that the good people of Plymouth county were partial to a "good understanding." There were twenty-two lots of butter, fifteen of cheese, and eighteen of bread, on exhibition, all very good and most of the lots excellent, proving conclusively that it is not necessary to go out of the old colony to find good dairy women. The display of fruit was not large; but we were glad to learn that more attention was being paid to its culture than formerly.

The show, as a whole, was a successful one. It was attended by a large concourse of people of both sexes, and every thing passed off in an orderly and systematic manner. A large number of the "descendants of the Pilgrims" were brought together and showed themselves worthy of their noble ancestry. On the afternoon of the second day a table was spread for four hundred guests, and loaded with the luxuries of the land, to which the ladies and gentlemen farmers of Plymouth county marched in procession, till every seat was occupied, and a large number went away disappointed, for want of room. After din-

ner speeches were made, the several committees made their reports, and the premiums awarded were paid.

One of the prominent features of this show was the large attendance of ladies. They appeared to be the wives and daughters of the farmers taking a lively interest in the success of the enterprise, and their presence in every department of the show and at the dinner table was most cheering.

There was one feature in this show, which, so far, I have forborne to mention, but which must not be passed over in silence. I allude to equestrianism by ladies, for which premiums were paid. The questions suggested themselves to my mind, What has the riding of ladies on horseback to do with agriculture? What right have societies to bestow the bounty of the State upon this object? I did not understand that the object was to test the excellence of the horse, or that the premium was paid for the best horse, but to the lady for excellence in horsemanship. This, no doubt, was the attractive feature of this show, and by inducing a large number to attend and pay an entrance fee, was a source of profit to the society; and as the money thus obtained was probably used to pay the premiums awarded to the ladies, this society cannot be charged with diverting the bounty of the State to that object. I mention this feature of the show, not for the purpose of condemning or approving, but merely to call attention to the subject. There are indications that this is to become a leading feature of the shows throughout the State, and great care should be taken that it does not absorb the interest which should be bestowed upon subjects more legitimate, useful and practicable.

The State of Massachusetts encourages the formation of agricultural societies, and, under certain rules and restrictions, places funds in the hands of their officers, to be awarded and paid out to such persons as have, in their judgment, done most to promote improvement in agriculture, and great care should be taken that no misapplication is made of those funds.

All of which is respectfully submitted.

IVERS PHILLIPS.

BARNSTABLE.

Delegated by the Board of Agriculture, to be present at the exhibition of the Barnstable County Society, to be holden at Barnstable on the 10th and 11th days of October last, and having attended to the duties thus conferred, it becomes my duty to make report of the transactions of the society on that occasion; and reflect the impressions left upon my mind, to those who imposed the duty. Most of the members of this Board can testify from their own happy experience, to the pleasure derived from the mutual exchange of these family visits; for the agricultural interest is the same, whether pursued upon the green hills of Berkshire, the pleasant and fertile valley of the Connecticut, or the more sandy and less attractive fields of Cape Cod. The sixteen local societies recognized by the fostering care of the Commonwealth, and each represented at this Board, constitute but one family, and have but one common interest,—the diffusion of agricultural science, or, in other words, mutual improvement in the various pursuits of agriculture; and the object is worthy of the means employed. The information derived from these various sources being presented here, compared, discussed and adjudicated by the concentrated action of this body, which constitutes the Agricultural Bureau of the Commonwealth, and then disseminated liberally back to the original donors in the more interesting form which they receive from the indefatigable labor, and unyielding perseverance of the discriminating mind of the Secretary, are the direct means thus far employed, to accomplish the object of our most earnest desires. How far these means have, or may for the future be realized by the agricultural community, must be looked for in the future testimony furnished to, and reported from, the Board of Agriculture in its annual reports. The official reports of the local societies are the original sources from which this testimony is derived; and the enthusiasm which usually prevails on the exciting occasion of our annual exhibitions, often lends a decided influence to the reports of the Secretary, and gives the lights and shades of the exhibition

a coloring, in proportion to the fervor of his feelings; and hence there may exist a discrepancy between the report of the local secretary and the visiting delegate from this Board.

Not having yet seen the first passing notice of the circumstances attending this occasion, I must refer to the more full and explicit report of the efficient secretary of the society for those details which were not observed by your delegate; but, trusting to the hasty memorandum made at that time, and the impressions still living in the memory, the exhibition was made under favorable auspices for the society. For the first time, the exhibition was to occupy two days, but unfortunately, as we thought, the distinct portions of it were too far separated to render them a perfect whole.

The show of cattle was directly in front of the railroad station; the ploughing match a fourth of a mile south, in rear of the custom house, with the exhibition of vegetables at Union Hall, and of domestic fabrics, fruits, et cetera, at the Court House. Under these disparaging circumstances the arduous duties of the officers were unusually increased and rendered more onerous. These difficulties were appreciated, and the disposition to avoid them in future was manifested at a meeting of the society on the afternoon of the first day, by an unanimous vote to purchase a suitable piece of ground for the use of the society, and a liberal sum was authorized to enable the Committee, at this time appointed, to execute the wishes of the society.

It now remains to recognize some of the leading features of the day. These commenced with the ploughing match at nine o'clock, A. M. The contest was entered by six competitors,—five with oxen and one with horses, each single teams. The lot selected was a rolling surface, with a stubborn, gravelly soil, and descending from two sides to the verge of a swamp, and furnished a favorable opportunity to test the skill of the ploughman in turning his furrows to the up-hill side of his lot. This difficulty was manfully met, and the execution of the work, under these circumstances, was decidedly good. The ploughs under trial, were the subsoil, with horses, the Michigan, Eagle, deep tiller, centre draft, and common colter, with oxen. Three of the ploughs reached the depth of from nine to twelve inches,

and left good work. The remaining three did not exceed six inches on an average, and the occupant of the field the present season will be the most competent witness to the advantages derived from the varied execution of the work; and we hope he will carefully notice, and report the result next fall.

The show of animals was the next feature of observation, the arrangements for which were well directed and executed. More than thirty convenient and substantial pens were provided; and, at an early hour, were generally occupied, three of which were tenanted with swine; and my memorandum says all were good, and to four very clean and nice ones is affixed the compliment of extra fine. Two of the pens were occupied with sheep, of South Down stock, and attracted no particular attention or remark, unless the ram, with a duplicate set of horns, was entitled to receive it. But one pair of fat cattle was observed, and these, though good for the season, would not have declined the favor of digesting a few bushels more of corn meal before meeting their final crisis. The aggregate of working oxen was quite limited, and so, too, of horses. Some fifteen or twenty of the latter were on the show ground, of which breeding mares and colts constituted the majority. Many of these colts were fine, and will richly remunerate their owners for the kind attentions bestowed upon them while preparing them for the duties of their destiny. It is a fact worth the record here, that there were no trials of speed, and none of that reckless Jehu driving, in the foolish attempt to be under two-forty, which so generally prevails at most of our county exhibitions, and gives the all-absorbing attention to the horse, to the great disparagement of our more useful farm stock. Of milch cows there were but few on exhibition, and none that would belong to the first order and first class of Guènon for the dairy. There were three or four bulls to be looked at, only one of which showed any distinct evidences of improvement over the common stock of the past generation; and this is an unpleasant feature, when viewed in its future developments upon the farm stock of the county. Better ones there may be within the limits of the society, if we were permitted to judge from the appearance of the young stock here exhibited, and this is the redeeming feature. Many of this class would have been an ornament to any show ground.

To designate might be considered invidious; but the two Alderney heifers and their associates we thought entitled to a special recognizance. If any apology, for these remarks upon the stock of Barnstable, should be required, we can only offer the prevailing drought, which had, to all appearance, almost destroyed every vestige of green herbage, so necessary, at this season of the year, for all animals.

Choice specimens of vegetables, of every variety usually raised in the garden or the field, were tastefully arranged in the hall, and gave testimony to the character of the soil and to the success of the cultivator. Mammoth cabbages, stupendous beets and potatoes, with undefined boundaries, are the testimonials for the declaration; samples of seed wheat, barley and corn were there, too, to sustain the testimony. Pleased with the examinaion here, the Court House next presented a claim to our observation. And here the collection of fruits which the horticulturist had contributed, and the artistic embellishments which female industry and ingenuity had furnished and tastefully arranged, gave the finale to the embodiment of pleasing associations connected with the transactions and duties of the day. Here were seen samples of bread and butter, of cheese and honey, which might tempt the awarding Committee to a breach of that commandment which forbids coveting our neighbor's goods, although bread and cheese are not specially designated. The show of fruits—among which the most approved varieties of the pear were conspicuous—apples, of twenty-two ounces,—cranberries, such as cannot be found, except on the Cape,—and quinces, a branch bearing eight, weighing seven pounds,—carry their own weight of testimony to the credit of the display.

These were some of the matters and things which constituted the exhibition at the Cattle Show in Barnstable, in 1855. It is our duty, and it enhances the pleasure of the occasion, to record the fact, that, in passing through the busy scenes of the day, mingling with the great assemblage of citizens here collected from the neighboring towns, not one instance of intemperance was noticed, scarcely a profane word was heard, and not an accident occurred, to mar the pleasures of our visit to the Cape.

FRANCIS BREWER.

AGRICULTURAL STATISTICS.

Special attention has been devoted, during the past year, to the collection of more complete statistics of Agriculture than have been heretofore obtained. There were, in 1845, 20 scythe factories, making annually 170,328 scythes, valued at $113,935, using a capital of $69,590, and employing 171 hands; in 1855, there were 12 manufactories, making annually 182,280 scythes, valued at $120,532, and with a capital of $66,000, and 144 hands.

Somewhat similar results are shown with reference to the manufacture of ploughs. There were in 1845, no less than 73 plough manufactories, making, on an average, 61,334 ploughs and other agricultural tools, valued at $121,691, employing a capital of $58,575, and 158 hands; while in 1855 there were only 22 plough manufactories, making annually 152,686 ploughs, valued at $707,175.86; or 340,316 ploughs and other agricultural tools, valued at $763,980.86, employing a capital of $189,300, and 433 hands.

The number of establishments for the manufacture of shovels, spades, forks and hoes, in 1845, was 39, and these articles were valued at $275,212. The capital employed in the business was $123,950, and the number of hands was 259. The number of similar establishments in 1855 was 21, while the articles manufactured were valued at $894,515. The capital invested amounted to $408,075, and the number of hands was 683.

There are, in Boston, five large Agricultural Warehouses, doing an aggregate business amounting to two and a half millions of dollars annually. At these establishments, alone, there were sold last year no less than 36,950 ploughs; 5,815 cultivators; 93,000 shovels; 60,000 hoes; 60,000 forks; 138,600 rakes; 33,600 scythes; 12,000 axes; 6,750 wheelbarrows; 11,900 hay cutters; 12,165 corn shellers; 5,100 grain cradles, and 1,850 horse rakes.

The agricultural statistics of Mass., for 1855, are as follows:

COUNTIES.	HORSES, OXEN, COWS AND CALVES.							
	Horses.	Value of Horses.	Oxen over three years old.	Steers under three years old.	Value of oxen and steers.	Milch Cows.	Heifers.	Value of cows and heifers.
Barnstable, .	2,235	$174,398 00	554	546	$37,890 00	3,764	1,357	$111,177 00
Berkshire, .	6,795	543,462 00	3,755	3,436	284,098 00	18,096	5,580	549,526 00
Bristol, .	5,490	502,898 00	3,118	992	191,142 00	9,306	1,455	277,803 00
Dukes, .	367	28,295 00	347	301	25,919 00	764	278	28,249 00
Essex, .	7,099	651,472 00	5,136	2,793	305,040 00	11,799	1,345	363,035 00
Franklin, .	4,467	342,419 00	4,812	4,531	346,668 00	9,501	3,828	415,077 00
Hampden, .	4,890	404,481 00	5,602	2,687	305,168 00	9,731	3,084	301,057 00
Hampshire, .	5,029	387,438 00	3,504	3,399	267,687 00	10,062	3,974	349,247 00
Middlesex, .	12,712	1,152,953 00	5,897	1,098	341,073 00	22,563	2,388	674,079 00
Nantucket, .	346	34,665 00	62	59	4,512 00	548	205	17,928 00
Norfolk, .	7,390	769,416 00	2,079	292	131,469 00	9,995	985	327,715 00
Plymouth, .	4,896	392,110 00	2,775	1,124	174,039 00	8,004	1,513	267,798 00
Suffolk, .	5,121	780,615 00	50	1	2,860 00	519	6	15,455 00
Worcester, .	13,484	1,120,267 00	12,534	6,027	828,776 00	33,917	9,443	1,194,145 00
Totals, .	80,321	$7,284,889 00	50,225	27,286	$3,246,341 00	148,569	35,441	$4,892,291 00

COUNTIES.	BUTTER, CHEESE AND HONEY.					
	Pounds of Butter.	Val. of Butter.	Pounds of Cheese	Val. of Cheese.	Pounds of Honey	Val. of Honey.
Barnstable, .	194,327	$61,836 00	1,325	$87 50	–	–
Berkshire, .	1,262,845	243,748 76	2,658,192	168,167 16	23,083	$3,242 86
Bristol, .	333,853	75,550 85	79,633	8,493 34	5,477	1,168 39
Dukes, .	28,382	7,112 20	3,987	493 00	–	–
Essex, .	533,853	121,434 00	80,063	7,915 00	3,223	664 00
Franklin, .	884,307	171,722 40	233,337	20,505 25	4,039	661 45
Hampden, .	729,637	145,813 36	381,721	34,707 05	7,900	7,910 33
Hampshire, .	931,295	184,422 01	336,015	31,757 94	5,937	970 33
Middlesex, .	838,748	192,735 20	72,695	6,322 16	5,889	983 44
Nantucket, .	24,152	7,155 60	–	–	–	–
Norfolk, .	316,254	77,538 00	42,277	3,983 55	5,073	949,66
Plymouth, .	399,878	101,725 85	82,501	9,131 53	5,046	942 04
Suffolk, .	500	100 00	–	–	100	15 00
Worcester, .	1,637,978	287,663 60	1,791,030	172,687 07	7,910	1,529 59
Totals, .	8,116,009	$1,678,557 83	5,762,776	$464,250 55	73,677	$19,037 09

COUNTIES.	CORN, INDIAN AND BROOM.								WHEAT.		
	Acres of Indian Corn.	Bushels of Indian Corn, per acre.	Value of Indian Corn.	Acres of Broom Corn.	Pounds of Broom Brush, per acre.	Value of Broom Brush.	Bush'ls of Broom Seed, per acre.	Value of Broom Seed.	Acres of Wheat.	Bush. of Wheat, per acre.	Value of Wheat.
Barnstable,	3,524	20	$71,777 20	– –	–	– –	–	– –	40½	13	$1,034 00
Berkshire,	9,158½	32	282,066 50	– –	–	– –	–	– –	513½	17	14,873 00
Bristol,	7,786½	27	186,032 00	– –	–	– –	–	– –	27	17	806 00
Dukes,	763	21	15,216 00	– –	–	– –	–	– –	–	–	– –
Essex,	5,471½	34	232,034 90	– –	–	– –	–	– –	90	14	2,466 00
Franklin,	7,925½	32	265,739 52	1,084½	581	$48,269 50	44	$13,105 87	542	15	15,411 00
Hampden,	8,816½	25	232,158 45	44	799	2,953 30	60	610 87	115	13	2,752 69
Hampshire,	10,041	29	327,477 10	1,938½	620	136,335 20	50	40,268 00	370½	15	8,870 75
Middlesex,	11,446	29	370,086 30	– –	–	– –	–	– –	201	13	6,225 75
Nantucket,	380	21	7,895 70	– –	–	– –	–	– –	2½	10	37 50
Norfolk,	4,299	35	143,520 45	– –	–	– –	–	– –	17	16	546 25
Plymouth,	5,171	27	136,649 18	– –	–	– –	–	– –	30	17	854 00
Suffolk,	88	37	3,838 00	– –	–	– –	–	– –	1	30	78 00
Worcester,	16,185½	30	545,617 67	2	400	80 00	–	– –	650¼	15	19,973 55
Totals,	91,056	28½	$2,820,108 97	3,069	600	$187,638 00	51	$53,984 74	2,600¼	15 $\frac{9}{13}$	$73,928 49

COUNTIES.	RYE.			BARLEY.			OATS.		
	Acres of Rye.	Bushels of Rye, per acre.	Value of same.	Acres of Barley.	Bushels of Barley, per acre.	Value of same.	Acres of Oats.	Bushels of Oats per acre.	Value of same.
Barnstable, .	2,043	7	$20,049 50	138¼	14	$2,439 00	410	18	$4,744 00
Berkshire, .	5,034½	14	80,424 47	442½	22	10,110 30	9,650½	30	157,221 45
Bristol, . .	1,612½	14	20,752 17	176	18	3,519 00	2,326	21	28,648 30
Dukes, . .	197	7	1,522 00	2	17	42 50	168	18	1,790 50
Essex, . .	1,012	16	20,258 25	824½	22	15,339 30	1,167½	24	18,489 90
Franklin, . .	4,427	13	52,706 27	353	19	6,181 75	3,059½	26	42,094 38
Hampden, . .	10,272	10	100,781 15	44	21	7,540 00	3,281	24	42,176 64
Hampshire, .	7,635	11	97,755 93	137	24	4,720 53	2,866	26	42,716 55
Middlesex, .	3,601¾	13	60,984 00	432½	19	8,497 00	3,194¾	24	51,700 95
Nantucket, .	13	9	117 00	23	24	644 00	66	19	772 20
Norfolk, . .	992	16	18,522 75	365¼	19	8,058 75	581½	22	6,982 32
Plymouth, . .	1,227¾	11	16,438 00	120½	17	2,472 87	923	21	11,836 38
Suffolk, . .	108	20	2,175 00	23	23	212 00	– –	–	– –
Worcester, .	3,967½	13	67,715 04	1,890	20	40,381 45	9,930	27	154,555 67
Totals, .	42,143	$12\frac{6}{14}$	$560,201 53	4,971½	20	$110,158 45	37,623¼	$21\frac{1}{13}$	$563,729 24

COUNTIES.	POTATOES.			ONIONS.			TURNIPS.		
	Acres of Potatoes	Bushels of Potatoes, per acre.	Val. of Potatoes.	Acres of Onions.	Bushels of Onions, per acre.	Value of Onions.	Acres of Turnips.	Bushels of Turnips, per acre.	Value of Turnips
Barnstable, .	915	72 1/2	$50,126 00	34 1/2	151 5/6	$4,000 00	81	149 1/2	$4,790 00
Berkshire, .	3,958	110	213,182 20	18	289 4/9	1,351 00	96 1/4	276	4,005 50
Bristol, . .	2,955 2/3	72	156,236 95	21 5/8	352 1/5	4,170 50	228 3/4	234 1/4	13,938 32
Dukes, . .	102	113	10,162 00	1/4	632	106 00	28 1/2	228	2,153 00
Essex, . .	3,138 1/2	92 1/2	236,878 75	521 5/6	338 1/2	147,136 00	109 1/4	241 1/2	8,471 00
Franklin, . .	2,658 1/4	93	105,548 03	5 3/4	189 3/4	990 25	17 1/2	254 1/5	1,370 40
Hampden, . .	3,326	93 2/5	175,156 85	14 1/2	360 3/4	3,343 40	209 1/4	228 1/2	8,622 62
Hampshire, .	3,156	101	181,717 49	8 5/6	420 5/7	2,454 50	534 1/4	200	3,298 50
Middlesex, .	6,583 1/2	85 1/9	475,537 15	42 3/4	260 2/3	7,486 10	405 1/2	313 1/2	29,596 47
Nantucket, .	72	108	7,776 00	5	187	516 00	51	152	3,100 40
Norfolk, . .	2,644	106 1/2	214,690 90	62 5/6	241 1/2	6,490 00	210 1/2	264 1/2	14,523 25
Plymouth, .	2,935 1/2	79	143,038 88	9	313 7/10	2,066 30	102 1/2	243 2/3	8,736 60
Suffolk, . .	99	90	8,202 00	1/2	–	– –	21	200	1,120 00
Worcester, .	9,439 1/2	96 1/2	543,653 22	24 1/2	332 1/5	7,336 40	172	246 1/2	12,625 00
Totals, .	41,982 11/12	93 5/7	$2,521,906 42	769 7/8	313	$187,446 45	2,267 1/4	231	$116,351 06

COUNTIES.	CARROTS.			BEETS AND OTHER ESCULENT VEGETABLES.				MILLET.	
	Acres of Carrots.	Bushels of Carrots, per acre.	Value of Carrots.	Acres of Beets and other Esculent Vegetables.	Value of same.	Acres cultivated in all other Grain or Root Crops.	Value of same.	Acres of Millet.	Value of Millet.
Barnstable,	36	220½	$2,110 50	62½	$2,840 00	21	$700 00	–	– –
Berkshire,	45½	515	5,179 53	18⅛	1,228 75	5,081	31,738 25	–	– –
Bristol,	14⅜	369	1,021 40	208¼	20,560 00	241	14,507 50	107¾	$1,699 00
Dukes,	2	350	210 00	– –	– –	– –	– –	–	– –
Essex,	448¼	451	18,861 55	375½	45,278 50	2,484	55,691 75	10	324 00
Franklin,	32	516	4,463 66	½	30 00	98	1,566 50	4¾	92 00
Hampden,	39¼	400	4,745 33	151¼	21,384 00	1,184¼	16,564 00	31¾	365 00
Hampshire,	21½	616	3,338 11	43	1,300 00	348	3,342 00	14	175 00
Middlesex,	260½	438	37,077 36	1,913¾	275,829 00	807	103,656 00	72½	1,292 00
Nantucket,	17	331½	1,690 65	95	9,535 00	– –	– –	–	– –
Norfolk,	246	427	23,793 87	402½	45,568 00	138	6,581 00	27	571 00
Plymouth,	58¾	373½	7,849 31	127¼	11,021 00	96½	7,569 00	2	28 00
Suffolk,	18	500	2,880 00	63	3,987 50	– –	– –	–	– –
Worcester,	240¾	473	34,819 95	393	46,006 50	712¾	44,286 75	33½	963 00
Totals,	1,479⅞	427⅓	$148,041 22	3,853⅝	$184,568 25	11,211½	$286,202 75	303¼	$5,509 00

COUNTIES.	HAY.						
	Acres of English Mowing.	Tons of English Hay.	Value of English Hay.	Tons of Wet Meadow or Swale Hay.	Value of Wet Meadow or Swale Hay.	Tons of Salt Hay.	Value of Salt Hay.
Barnstable, .	4,391	5,526	$87,266 00	937	$11,865 00	7,370	$51,037 00
Berkshire, .	76,962	75,948	752,960 00	5,242	30,838 00	– –	– –
Bristol, . .	34,597	28,234½	509,566 00	6,124¼	57,238 00	1,645½	12,040 00
Dukes, . .	1,539	1,810	26,957 00	612	5,051 00	399	3,459 00
Essex, . .	33,565	36,393¾	654,432 00	10,124½	83,904 00	11,422	107,683 00
Franklin, . .	43,049	41,392	475,303 00	7,957	53,413 00	– –	– –
Hampden, . .	29,720	35,947	425,416 00	9,977	63,380 00	– –	– –
Hampshire, .	41,270	38,700½	489,403 00	9,496	66,441 00	– –	– –
Middlesex, .	61,452¾	61,578¾	1,207,438 00	25,990½	251,220 00	2,356½	25,294 00
Nantucket, .	1,425	2,463	39,328 00	179	1,790 00	209	1,463 00
Norfolk, . .	30,042	28,444	568,592 00	11,732	104,171 00	2,445	27,392 00
Plymouth, . .	22,610¾	19,948¼	355,985 00	8,391	68,379 00	5,088	40,480 00
Suffolk, . .	740	1,039	23,702 00	– –	– –	1,180	16,720 00
Worcester, .	117,116¾	109,919¾	1,745,658 00	32,389	257,053 00	– –	– –
Totals, .	498,480¼	487,344½	$7,362,006 00	129,151¼	$1,054,743 00	32,115	$285,568 00

COUNTIES.	APPLE AND PEAR TREES, CHERRIES, NUTS, BERRIES, &c.					HOPS.			TOBACCO.	
	Apple Trees cultivated for their fruit.	Value of Apples.	Pear Trees cultivated for their fruit.	Value of Pears.	Value of Cherries, Nuts, Berries and all fruit not otherwise enumerated.	Number of acres of hops.	Pounds of hops, per acre.	Value of Hops.	Acres of Tobacco.	Value of Tobacco.
Barnstable, .	25,939	$10,080 00	2,124	$803 00	– –	–	–	– –	–	– –
Berkshire, .	121,275	56,118 24	4,223	4,440 00	– –	3	600	$324 00	2	$250 00
Bristol, . .	157,161	53,260 00	22,168	3,737 00	$500 00	–	–	– –	–	– –
Dukes, . .	7,733	1,521 00	118	100 00	– –	–	–	– –	–	– –
Essex, . .	239,127	166,905 65	27,023	12,227 45	16,952 00	No ret'n.	No ret'n.	80	–	– –
Franklin, . .	66,009	40,929 90	953	1,080 00	1,301 00	54	778½	10,302 50	93½	12,403 00
Hampden, . .	148,694	48,702 00	2,700	1,623 00	1,637 32	–	–	– –	170½	21,220 74
Hampshire, .	78,892	40,392 50	2,073	1,202 00	470 00	3	2,400	480 00	155	23,600 00
Middlesex, .	551,586	297,395 24	42,684	24,352 00	38,502 00	112	604⅜	21,625 00	–	– –
Nantucket, .	– –	– –	6	40 00	489 00	–	–	– –	–	– –
Norfolk, . .	175,723	101,667 00	41,941	23,416 00	18,650 50	No ret'n.	No ret'n.	10 00	–	– –
Plymouth, . .	194,521	62,069 35	15,572	3,471 76	3,744 00	–	–	– –	–	– –
Suffolk, . .	4,500	5,818 00	1,020	2,830 00	– –	–	–	– –	–	– –
Worcester, .	465,740	236,402 92	22,787	8,822 00	23,590 00	93¾	587	14,719 36	–	– –
Totals, .	2,236,900	$1,121,261 80	185,392	$88,144 21	$105,835 82	265¾	655½	$47,461 66	421	$57,473 74

COUNTIES.	SHEEP AND WOOL.								CRANBERRIES.		BEESWAX.	
	Saxony Sheep, of different grades.	Merino Sheep, of different grades.	All other kinds of Sheep.	Val. of all Sheep.	Pounds of Wool produced from Saxony Sheep.	Pounds of Merino Wool.	Pounds of all other Wool.	Val. of all Wool.†	Acres of Cranberries.	Value o Cranberries.	Pounds of Beeswax.	Value of Beeswax.
Barnstable, .	–	–	1,477	$3,287 00	–	– –	3,578	$1,323 00	197	$16,916 00	– –	– –
Berkshire, .	4,296	43,122	16,405	116,678 00	8,243	129,640	50,400	69,664 00	–	– –	509½	$153 12
Bristol, .	217	588	5,545	14,247 00	192	1,326	14,221	6,823 00	380	12,282 00	165	60 22
Dukes, .	–	1,351	7,781	21,607 00	–	3,650	16,241	7,359 00	14	1,297 00	– –	– –
Essex, .	9	181	2,027	6,263 00	27	528	5,920	2,396 00	370	8,488 00	39	14 63
Franklin, .	303	7 396	11,408	44,613 00	1,212	23,616	34,765	22,039 00	9⅛	505 00	99½	35 49
Hampden, .	539	1,429	7,421	23,204 00	1,617	3,293	22,977	10,402 00	13½	439 00	169	61 67
Hampshire, .	1,299	11,006	9,822	44,521 00	2,950	25,063	31,845	22,147 00	5	40 00	209	78 00
Middlesex, .	–	37	880	2,295 00	–	– –	2,362	873 00	2,554⅝	29,274 00	87	34 74
Nantucket, .	–	–	1,201	3,483 00	–	– –	3,209	1,187 00	19¾	1,140 00	– –	– –
Norfolk, .	6	–	270	1,001 00	–	– –	881	326 00	897	30,000 00	543	269 00
Plymouth, .	1	–	2,986	8,153 00	–	– –	8,623	3,090 00	361½	12,098 85	350	168 80
Suffolk, .	–	–	–	– –	–	– –	– –	– –	–	– –	– –	– –
Worcester, .	136	474	5,602	20,491 00	308	1,388	18,081	7,417 00	641¼	22,720 00	153½	67 10
Totals, .	6,806	65,584	72,825	$309,843 00	14,549	188,504	213,103	$155,046 00	5,462¾	$135,199 85	2,324½	$942 77

COUNTIES.	MAPLE SUGAR. Pounds of Maple Sugar manufactured.	MAPLE SUGAR. Value of the same.	SWINE. Number of Swine	SWINE. Value of Swine.	MILK. Number of quarts of Milk.	MILK. Value of Milk.	POULTRY AND EGGS. Value of Poultry and Eggs.
Barnstable,	–	–	1,378	$16,386 00	–	–	$22,106 00
Berkshire,	102,465	$8,481 30	3,324	29,763 10	–	$1,215 00	2,611 00
Bristol,	–	–	6,153	60,425 00	619,031	24,356 36	3,575 50
Dukes,	–	–	146	1,460 00	–	–	–
Essex,	–	–	3,369	54,209 50	1,811,936	94,591 93	–
Franklin,	123,056	11,477 12	4,100	41,133 00	–	–	2,576 70
Hampden,	233,000	26,700 00	3,138	25,525 00	393,283	17,735 00	2,154 33
Hampshire,	61,920	5,635 00	2,051	14,035 00	–	–	5,615 00
Middlesex,	–	–	4,874	62,134 00	4,309,084	348,938 80	1,200 00
Nantucket,	–	–	541	10,112 00	–	–	–
Norfolk,	–	–	6,763	89,230 11	2,584,404	94,225 70	–
Plymouth,	–	–	4,253	57,113 00	121,240	9,486 00	6,912 00
Suffolk,	–	–	–	–	476,220	32,263 75	–
Worcester,	–	–	11,023	120,011 00	2,888,464	133,075 36	5,938 00
Totals,	520,441	$52,293 42	51,113	$581,536 71	13,203,665	$755,887 90	$52,688 53

APPENDIX.

RETURNS OF AGRICULTURAL SOCIETIES FOR 1854.

FINANCES.

SOCIETIES.	Amount received from the Commonwealth.	Income of Fund.	New Members and Donations.	All other sources.	Whole amount of Receipts for the year.	Amount of Premiums and Gratuities offered.	Amount of Premiums, &c., awarded.	Amount of Premiums paid out.	Current expenses of the Society for the year.	Whole amount of Disbursements for the year.	Value of Real Estate belonging to the Society.	Am't of the Permanent Fund (par value.)	Total amount of all the property of the Society.
Massachusetts, . . .	$ 600 00	$1,948 83	–	–	$2,548 83	–	–	$1,779 57	$229 08	$2,407 68	–	24,100 00	$24,100 00
Essex, ...	600 00	598 12	$174 00	$314 43	1,686 55	2,061 00	1,189 37	765 61	513 56	1,279 17	–	9,770 70	11,668 56
Middlesex, ...	600 00	180 00	100 00	300 00	1,180 00	1,025 00	728 00	700 00	300 00	1,060 00	$2,000 00	3,000 00	5,000 00
Middlesex South, . .	600 00	56 66	129 00	517 42	1,303 08	1,053 00	700 00	595 75	525 16	656 22	2,300 00	3,600 00	3,600 00
Middlesex North, . .	600 00	–	1,216 00	114 00	1,960 00	635 00	565 20	230 62	174 75	739 95	–	3,000 00	–
Worcester, ...	600 00	250 00	200 00	1,042 12	2,092 12	1,293 00	647 00	647 00	738 10	1,964 13	15,000 00	6,411 20	14,686 20
Worcester West, . .	600 00	–	54 00	7 25	661 25	676 00	457 00	425 00	215 32	640 32	–	3,195 93	3,195 93
Worcester North, . .	560 00	182 60	315 00	94 53	1,152 13	639 00	593 97	499 44	180 62	680 06	–	3,100 00	3,100 00
Worcester South, . .	–	11 23	1,229 50	73 75	1,314 48	329 75	219 00	78 00	106 45	184 45	–	1,229 50	1,379 50
Hampshire, Franklin and Hampden, . .	600 00	502 11	74 50	352 21	1,528 82	976 75	646 30	592 01	763 34	1,353 38	–	8,051 28	8,251 28
Hampshire, ...	600 00	165 14	210 50	–	975 64	526 25	367 37	316 37	326 77	773 14	–	3,388 86	3,606 64
Hampden, ...	600 00	258 38	256 30	293 16	1,407 84	1,262 75	726 25	397 00	672 09	1,069 09	–	3,750 00	4,794 39
Franklin, ...	600 00	154 54	657 50	193 11	1,605 15	641 75	428 12	320 62	704 11	1,024 73	–	5,099 25	5,609 90

Berkshire, ...	600 00	60 00	13 00	1,762 17	2,435 17	800 00	812 50	812 50	1,300 00	1,374 00	6,500 00	1,000 00	7,500 00
Housatonic, ...	600 00	295 00	74 00	1,448 23	2,417 23	838 00	901 00	895 00	1,220 20	2,409 91	6,000 00	7,333 33	13,333 33
Norfolk, ...	600 00	–	297 00	1,877 03	2,774 03	2,493 25	975 00	565 50	2,641 44	3,206 94	6,129 89	–	6,129 89
Bristol, ...	600 00	252 20	558 00	1,462 50	2,872 70	1,256 00	894 62	894 62	1,793 86	2,688 48	–	3,640 00	3,640 00
Plymouth, ...	600 00	560 79	445 00	1,979 67	3,585 46	1,150 25	1,028 50	928 90	1,163 63	7,559 69	4,500 00	10,616 23	10,616 23
Barnstable, ...	382 00	109 80	20 00	108 25	620 05	–	348 12	323 62	170 00	593 62	–	1,830 00	1,830 00
Totals, ...	10,542 00	5,585 40	6,053 30	11,939 83	34,120 53	17,566 75	12,257 32	11,737 13	13,729 48	31,574 32	42,429 89	102,116 28	132,041 85

PERMANENT FUND—HOW INVESTED.

MASSACHUSETTS.—Stock in Boston Banks.

ESSEX.—Bank stock, bonds and notes secured by mortgages.

MIDDLESEX.—Bank stock, notes, railroads and mortgages.

MIDDLESEX SOUTH.—Real estate, bank stock and cattle pens.

MIDDLESEX NORTH.—Notes at interest.

WORCESTER.—Bank stock, notes and real estate.

WORCESTER WEST.—In notes of hand and cattle pens.

WORCESTER NORTH.—Notes of hand, cattle pens, and implements.

WORCESTER SOUTH.—Loaned on collateral security.

HAMPSHIRE, FRANKLIN AND HAMPDEN.—Notes secured by mortgages and personal securities.

HAMPDEN.—Promissory notes, secured by real estate and otherwise.

FRANKLIN.—Notes, well secured.

HAMPSHIRE.—Loans on mortgages of real estate, $2,483.29; loans on notes bearing interest, $207.50; subscribers on life members' notes, on interest—good, $263; other loans on interest, $283.16; doubtful, $80.50.

BERKSHIRE.—In personal securities.

HOUSATONIC.—Notes of hand against individual members on annual interest.

NORFOLK.—In land, agricultural hall, cattle pens, fixtures, furniture, &c., at cost.

BRISTOL.—Stock of Taunton Bank; notes of Bristol County.

PLYMOUTH.—31 shares of Plymouth Bank, $3,100; 3 shares North American Bank, $300; 5 shares State Banking Company, $300; 2 bonds Cape Cod Railroad, $700; 7 promissory notes, $5,450.

BARNSTABLE.—2 notes of hand considered good, $1,850; in Barnstable Savings Institution, $1,910.

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.

FOR FARMS, &c.

SOCIETIES.	For management of farms.	For draining.	For subsoil ploughing.	For ploughing at exhibition.	Reclaiming meadow lands.	For manures and experiments with them.	For Orchards of all kinds.	For improvements on farm.	Amount offered for farm improvements.	Amount awarded for farm improvements.	Amount paid for farm improvements.
Essex,	–	$15 00	–	$118 24	$25 00	–	–	$25 00	$230 00	$183 24	$184 00
Middlesex,	–	–	–	79 00	–	–	–	15 00	99 00	94 00	94 00
Middlesex South,	–	–	–	57 00	25 00	–	$53 00	10 00	237 00	96 00	73 00
Middlesex North,	–	–	–	62 40	–	–	–	–	–	–	–
Worcester,	–	–	–	93 00	10 00	–	–	–	125 00	–	10 00
Worcester West,	–	–	–	43 00	–	–	–	–	48 00	–	–
Worcester North,	$15 00	–	–	44 00	–	$8 00	8 00	–	15 00	15 00	15 00
Worcester South,	–	–	–	22 50	–	–	–	–	–	–	–
Hampshire, Franklin & Hampden,	–	–	$10 00	39 75	–	10 00	17 00	–	75 00	20 00	–
Hampshire,	–	–	5 00	24 50	–	6 00	19 00	–	138 00	54 50	53 50
Hampden,	10 00	–	–	–	6 00	–	18 00	–	55 00	16 00	–
Franklin,	–	–	–	11 00	11 00	–	21 00	–	93 00	11 00	6 00
Berkshire,	–	–	–	47 00	10 00	–	15 00	–	–	–	–
Housatonic,	–	–	–	60 00	30 00	–	–	–	30 00	30 00	30 00
Norfolk,	–	–	–	54 00	–	–	42 00	71 00	765 00	167 00	132 00
Plymouth,	–	–	–	57 75	15 00	38 00	8 00	–	191 50	61 00	61 00
Bristol,	–	–	–	63 00	–	–	–	8 00	385 00	71 00	71 00
Barnstable,	12 00	–	–	33 00	10 00	–	–	–	117 00	55 00	55 00
Totals,	$37 00	$15 00	$15 00	$909 14	$142 00	$62 00	$201 00	$129 00	$2,603 50	$873 74	$784 50

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED—Continued.

FOR FARM STOCK.

SOCIETIES.	Bulls.	Working Oxen.	Milch Cows.	Heifers & Calves.	Fat Cattle and Steers.	Horses.	Swine.	Sheep.	Poultry.	All other stock.	Total offered for live stock.	Total awarded for live stock.	Total paid out for live stock.
Massachusetts,	–	–	$75 00	–	–	–	–	–	–	–	–	–	$408 03
Essex,	$29 60	$33 12	85 44	$44 20	$26 76	$139 88	$32 00	–	$10 00	$32 88	$400 00	$463 88	223 00
Middlesex,	61 00	30 00	106 00	34 00	24 00	49 00	35 00	–	18 00	12 00	554 00	369 00	369 00
Middlesex South,	62 00	19 00	76 00	36 00	5 00	90 00	37 00	–	13 25	13 00	430 00	351 25	235 75
Middlesex North,	70 90	21 50	31 00	36 00	11 00	57 80	38 70	–	21 30	–	350 60	288 20	110 00
Worcester,	8 00	43 00	23 00	10 00	10 00	158 00	48 00	$17 00	24 00	75 00	789 00	408 00	408 00
Worcester West,	29 00	36 00	–	29 00	47 00	50 00	34 00	8 00	11 00	30 00	362 00	274 00	250 00
Worcester North,	31 00	27 00	36 00	25 00	37 00	49 00	19 50	6 75	7 00	23 50	275 50	261 75	237 75
Worcester South,	13 00	22 50	5 00	7 75	8 00	25 00	12 00	10 00	–	27 75	151 75	131 50	32 00
Hampshire, Frank. & Hampd.,	21 00	84 00	13 00	13 00	48 00	71 75	16 00	7 00	8 97	28 00	478 00	353 68	405 26
Hampshire,	28 00	39 00	9 00	11 00	31 00	43 00	10 00	3 00	2 00	–	191 00	176 00	168 50
Hampden,	41 00	113 00	16 00	32 00	53 00	89 00	29 00	12 00	1 50	–	499 50	414 00	322 00
Franklin,	25 00	27 00	28 00	9 50	24 00	62 00	16 00	28 00	5 00	39 00	335 50	263 50	217 15
Berkshire,	22 00	60 00	57 00	28 00	12 00	140 00	28 00	63 00	18 00	32 00	434 00	460 00	460 00
Housatonic,	23 00	31 00	35 00	29 00	15 00	86 00	21 00	59 00	6 00	70 00	359 00	375 00	371 00
Norfolk,	39 00	25 00	149 00	25 00	13 00	258 00	40 00	–	31 50	–	991 00	571 50	254 00
Bristol,	36 00	69 00	35 00	12 00	37 00	103 00	18 00	–	29 00	15 00	307 00	354 00	354 00
Plymouth,	23 50	57 00	31 00	38 00	47 75	48 75	19 00	–	20 00	–	290 50	287 00	281 75
Barnstable,	15 00	14 00	18 00	8 00	18 00	34 00	29 00	8 00	3 50	17 00	187 00	164 50	164 50
Totals,	$569 00	$751 12	$828 44	$427 45	$467 51	$1,554 18	$482 20	$221 75	$260 02	$415 13	$7,298 35	$5,966 76	$5,271 69

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED—Continued.

FOR FARM PRODUCTS.

SOCIETIES.	Indian Corn.	Wheat.	Rye.	Barley.	Oats.	Other Grain Crops.	Grass Crops.	Potatoes.	Carrots.	Beets.	Turnips.
Essex,	$10 00	–	–	–	$10 00	–	–	–	$10 00	–	$10 00
Middlesex,	10 00	–	–	–	–	–	–	–	–	–	–
Middlesex South,	8 00	–	–	–	–	–	–	$1 75	–	–	50
Middlesex North,	–	–	–	–	–	–	–	–	–	–	–
Worcester,	–	–	–	–	–	–	–	–	–	–	–
Worcester West,	3 00	–	–	–	6 00	–	–	8 00	–	–	–
Worcester North,	22 00	$6 00	$5 00	–	3 00	–	–	6 00	5 00	–	–
Worcester South,	–	–	–	–	–	–	–	–	–	–	–
Hampshire, Franklin and Hampden,	6 00	–	5 00	–	–	–	–	5 00	8 00	–	2 00
Hampshire,	5 00	–	2 00	–	3 00	–	–	6 00	3 00	–	2 00
Hampden,	5 75	5 00	4 00	–	–	–	–	10 25	3 00	$1 25	2 00
Franklin,	3 00	12 00	3 00	–	–	–	–	4 00	2 00	–	2 00
Berkshire,	22 00	34 00	24 00	$17 00	19 00	23 00	–	16 00	9 00	–	5 00
Housatonic,	53 00	17 00	33 00	–	25 00	23 00	$9 00	9 00	6 00	–	1 00
Norfolk,	16 00	–	–	–	–	–	–	–	8 00	–	–
Bristol,	33 00	–	–	6 00	3 00	4 00	4 00	–	–	–	13 00
Plymouth,	83 50	6 00	8 00	8 00	–	12 50	–	–	17 50	–	16 25
Barnstable,	50	5 00	4 00	5 00	–	–	–	5 50	3 50	50	3 50
Totals,	$289 75	$85 00	$88 00	$36 00	$69 00	$62 50	$13 00	$71 50	$75 00	$1 75	$57 25

FARM PRODUCTS—CONTINUED.

SOCIETIES.	Other Root Crops	Amount offered for Root and Grain Crops.	Amount awarded for Root and Grain Crops.	Amount paid out for Grain and Root Crops.	Amount awarded for Broom Corn.	Any other cultivated Crops.	Fruits & Flowers.	Milk.	Butter & Cheese.	Bread & Honey.
Essex,	–	$295 00	$40 00	$40 00	–	*$62 00	$95 50	–	$22 00	–
Middlesex,	–	94 00	10 00	10 00	–	26 75	†142 20	–	23 00	$20 00
Middlesex South,	$27 00	52 00	13 00	–	–	–	1 00	–	10 00	–
Middlesex North,	–	40 00	32 55	–	–	32 50	100 50	–	42 00	–
Worcester,	–	74 00	–	–	–	–	–	–	60 00	–
Worcester West,	–	58 00	17 00	17 00	–	3 00	11 50	–	52 00	–
Worcester North,	–	65 00	47 00	47 00	–	21 14	41 33	–	12 00	–
Worcester South,	–	–	–	–	–	–	12 50	–	14 00	–
Hampshire, Franklin and Hampden,	–	45 00	31 00	–	–	19 00	29 75	–	19 00	10 00
Hampshire,	–	48 00	26 00	26 00	5 00	–	21 00	–	25 50	–
Hampden,	–	114 00	45 75	19 00	–	–	32 50	–	33 50	–
Franklin,	–	61 00	23 00	–	7 00	–	25 00	–	11 00	–
Berkshire,	–	147 00	172 00	172 00	–	–	25 50	–	34 00	–
Housatonic,	9 00	208 00	185 00	185 00	–	17 00	46 00	–	42 00	–
Norfolk,	–	151 00	24 00	39 00	–	39 00	61 00	–	37 00	–
Bristol,	–	264 00	63 00	63 00	–	–	153 00	–	28 00	15 12
Plymouth,	13 00	219 00	164 75	133 75	–	–	75 00	–	50 00	8 00
Barnstable,	50	70 00	28 00	28 00	–	6 25	11 75	–	12 00	–
Totals,	$49 50	$1,915 00	$922 05	$781 75	$12 00	$226 64	$885 03	–	$527 00	$53 12

* Vegetables present at the show. † Fruits.

MISCELLANEOUS.

SOCIETIES.	Amount awarded for agricultural implements.	Amount awarded for all other agricultural objects.	Amount awarded for objects other than agricultural.	Number of persons who have received premiums and gratuities for agricultural objects.
Essex,	$133 00	$881 62	$174 75	157
Middlesex,	8 00	–	35 00	115
Middlesex South,	–	609 50	90 50	100
Middlesex North,	20 00	–	40 00	62
Worcester,	–	70 00	10 00	73
Worcester West,	8 00	400 50	48 50	79
Worcester North,	9 00	8 00	*82 50	105
Worcester South,	–	33 50	–	39
Hamp., Frank. and Hampd.,	13 50	23 51	88 00	113
Hampshire,	10 50	26 18	27 69	160
Hampden,	12 00	15 50	151 00	164
Franklin,	24 50	–	62 62	197
Berkshire,	17 00	7 00	75 00	200
Housatonic,	10 00	–	136 00	233
Norfolk,	10 00	–	65 50	106
Bristol,	–	66 50	144 00	224
Plymouth,	5 00	23 00	295 00	315
Barnstable,	5 00	–	65 57	113
Totals,	$285 50	$2,164 81	$1,591 63	2,555

*Town teams of oxen, $37.

Names of Towns and Cities in which Premiums and Gratuities for Agricultural objects were distributed by each Society, and amount to each town.

ESSEX.

Amesbury,	$31 50	Middleton,	$10 98
Andover,	35 30	Newbury,	67 30
Beverly,	9 00	Newburyport,	14 50
Boxford,	33 00	North Andover,	118 00
Bradford,	198 50	Rowley,	21 18
Danvers,	28 00	Salem,	23 48
Georgetown,	31 00	Salisbury,	6 96
Haverhill,	195 00	South Danvers,	27 00
Ipswich,	12 44	Topsfield,	4 38
Lawrence,	15 00	Wenham,	2 60
Lynn,	13 00	West Newbury,	36 75
Lynnfield,	2 00	Boston,	25 00
Marblehead,	32 00		
Methuen,	20 75	Total,	$1,014 62

MIDDLESEX.

Acton,	$16 50	Cambridge,	$18 00
Ashby,	15 00	Charlestown,	1 00
Bradford,	6 50	Chelmsford,	11 00
Billerica,	5 00	Concord,	244 25
Brighton,	9 00	Dracut,	12 00

MIDDLESEX—Continued.

Framingham,	$10 00	Stowe,	$11 00
Lexington,	15 00	Wayland,	31 00
Lincoln,	31 50	Waltham,	13 00
Littleton,	11 00	Watertown,	7 00
Lowell,	6 00	Weston,	3 00
Malden,	3 00	Wilmington,	82 75
Marlborough,	41 00	Woburn,	1 00
Medford,	5 00	West Cambridge,	3 50
South Reading,	14 00	Total,	$693 00
Sudbury,	36 00		

MIDDLESEX SOUTH.

Ashland,	$35 00	Sherborn,	$13 50
Framingham,	355 25	Southborough,	95 00
Holliston,	19 25	Stowe,	3 00
Hopkinton,	12 00	Westborough,	1 50
Marlborough,	34 00	Total,	$611 75
Natick,	43 25		

MIDDLESEX NORTH.

Lowell,	$160 00	Dunstable,	$34 00
Dracut,	27 00	Billerica,	15 00
Chelmsford,	191 00	Tyngsborough,	2 50
Westford,	17 75	North Reading,	25
Wilmington,	46 00	Fancy Work, &c.,	34 30
Tewksbury,	37 40	Total,	$565 20

WORCESTER.

Auburn,	$6 00	Oakham,	$10 00
Barre,	32 00	Oxford,	23 00
Boylston,	14 00	Princeton,	83 00
Charlton,	49 00	Shrewsbury,	72 00
Grafton,	53 00	Southbridge,	2 00
Hardwick,	8 00	Sterling,	1 00
Lancaster,	14 00	Sutton,	13 00
Leicester,	16 00	West Boylston,	31 00
Millbury,	8 00	Westborough,	20 00
New Braintree,	31 00	Worcester,	137 00
Northborough,	6 00	Total,	$629 00

WORCESTER WEST.

Barre,	$233 00	Princeton,	$19 00
Hardwick,	24 00	Phillipston,	1 00
Hubbardston,	8 50	Petersham,	59 00
New Braintree,	16 00	Templeton,	10 00
North Brookfield,	3 00	West Brookfield,	4 00
Oakham,	1 00	Total,	$378 50

WORCESTER NORTH.

Gardner,	$18 45	Fitchburg,	$296 57
Princeton,	78 12	Shirley,	3 00
Winchendon,	12 00	Ashby,	46 32
Westminster,	34 65	Sterling,	41 47

WORCESTER NORTH—Continued.

Royalston,	$7 00	Leominster,	$14 25
Ashburnham,	18 77	Groton,	2 00
Harvard,	13 00	Unknown,	5 25
Lunenburg,	3 12	Total,	$593 97

WORCESTER SOUTH.

Sturbridge,	$56 00	West Brookfield,	$14 00
Southbridge,	28 00	Warren,	16 75
Dudley,	12 75	Brimfield,	8 25
Charlton,	49 75	Total,	$185 50

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Chesterfield,	$2 00	Russell,	$3 00
Conway,	13 50	Southampton,	26 00
Easthampton,	44 00	South Hadley,	40 00
Goshen,	7 00	Westfield,	75 00
Granby,	2 00	Worthington,	4 00
Hatfield,	35 50	Williamsburg,	1 50
Hadley,	26 50	Westhampton,	2 00
Huntington,	9 00	Middlefield,	11 00
Leverett,	4 00	Whately,	11 00
Northampton,	149 00	Total,	$166 00
North Hadley,	1 00		

HAMPSHIRE.

Amherst,	$119 57	Middlefield,	$0 25
Belchertown,	17 25	Montague,	2 62
Brattleborough,	2 00	New Salem,	11 00
Chicopee,	1 00	Northampton,	75
Conway,	37	Pelham,	8 50
Deerfield,	19 62	Prescott,	1 12
Enfield,	50	Shutesbury,	1 50
Goshen,	2 00	Sunderland,	77 97
Granby,	13 50	Templeton,	1 50
Greenfield,	6 00	Ware,	3 00
Hadley,	48 36	Wendell,	2 00
Leverett,	25 62	West Springfield,	1 00
Ludlow,	37	Total,	$367 37

HAMPDEN.

Blandford,	$5 00	Springfield,	$188 00
Brimfield,	4 00	West Springfield,	62 50
Chicopee,	43 00	Southwick,	5 50
Holyoke,	5 00	Westfield,	75 50
Ludlow,	12 00	Wilbraham,	77 50
Longmeadow,	69 75	Total,	$547 75

FRANKLIN.

Bernardston,	$8 00	Coleraine,	$26 25
Buckland,	50	Conway,	15 75
Chicopee,	2 00	Deerfield,	42 75

FRANKLIN—CONTINUED.

Erving,	$4 00	Northfield,	$14 00
Gill,	3 75	Orange,	3 75
Greenfield,	107 75	Shelburne,	104 75
Heath,	15 50	Sunderland,	32 00
Leyden,	29 50	Warwick,	1 00
Montague,	8 25	Whately,	75
New Salem,	3 00	Total,	$123 25

BERKSHIRE.

Pittsfield,	$278 00	West Stockbridge,	$27 00
Lanesborough,	125 00	Great Barrington,	30 00
Hancock,	3 00	Sheffield,	34 00
Cheshire,	19 00	Egremont,	29 00
Adams,	68 00	Monterey,	10 00
Williamstown,	30 00	Dalton,	21 00
Richmond,	44 00	Windsor,	5 00
Lenox,	41 00	Peru,	5 00
Lee,	27 00	Total,	$842 00
Stockbridge,	46 00		

HOUSATONIC.

Lee,	$13 00	Lenox,	$27 00
West Stockbridge	41 00	Lanesborough,	5 00
Stockbridge,	88 00	Sheffield,	182 00
Egremont,	166 00	Richmond,	21 00

HOUSATONIC—Continued.

Monterey,	$27 00	Tyringham,	$1 00
Alford,	28 00	Westfield,	2 00
Great Barrington,	263 00	Pittsfield,	2 00
New Marlborough,	14 00	Total,	$895 00
Sandisfield,	15 00		

NORFOLK.

Braintree,	$55 00	Needham,	$218 00
Brookline,	25 00	Quincy,	12 00
Canton,	6 00	Randolph,	5 00
Dedham,	79 50	Roxbury,	73 00
Dorchester,	163 00	Stoughton,	12 00
Dover,	40 00	Walpole,	14 00
Foxborough,	15 00	West Roxbury,	67 00
Medfield,	14 00	Wrentham,	9 00
Medway,	23 00	Out of the County,	55 00
Milton,	24 00	Total,	$909 50

BRISTOL.

Norton,	$62 00	Pawtucket,	$3 00
Taunton,	82 75	Fall River,	17 75
Raynham,	88 00	Seekonk,	10 50
Dartmouth,	31 50	Mansfield,	19 00
New Bedford,	310 75	Berkley,	3 00
Somerset,	6 00	Attleborough,	12 00
Fairhaven,	79 37	Easton,	8 00
Westport,	17 00	Total,	$750 62

PLYMOUTH.

Bridgewater,	$385 00	Plymouth,	$23 00
East Bridgewater,	88 25	Plympton,	24 25
West Bridgewater,	81 25	Hanson,	4 75
North Bridgewater,	108 25	South Scituate,	50
Abington,	83 00	Duxbury,	4 00
Halifax,	5 00	Rochester,	14 00
Middleborough,	100 50	Marshfield,	1 00
Carver,	34 50	Hanover,	1 75
Pembroke,	28 00	Lakeville,	26 75
Kingston,	3 75	Not known,	4 00
Hingham,	6 00	Total,	$1,027 50

BARNSTABLE.

Barnstable,	$188 62	Harwich,	$7 75
Yarmouth,	36 00	Chatham,	13 00
Sandwich,	43 25	Provincetown,	50
Dennis,	9 75	Nantucket (gratuity),	5 25
Brewster,	28 75	Total,	$340 87
Falmouth,	8 00		

[A.]

Inventory of Personal Property on the State Farm at Westboro', December 1, 1854.

4	Yoke Oxen,	$665 00
23	Cows,	805 00
1	Heifer Calf,	4 00
1	Full blood Jersey Bull,	150 00
3	Horses,	520 00
75	Swine,	558 00
43	Tons English Hay,	774 00
18	Tons Meadow Hay,	162 00
7	Tons Straw,	70 00
900	Bushels Indian Corn,	900 00
2058	Bushels Carrots, 25 cts.,	514 50
1025	Bushels Turnips,	170 83
20	Tons Corn Fodder,	120 00
4	Hay Cutters,	50 00
1	Feed Trough,	4 00
12	Hay Forks,	5 00
18	Hay Rakes,	5 40
28	Manure Forks,	28 00
48	Shovels,	25 00
18	Spades,	15 00
18	Picks,	18 00
2	Manure Forks,	1 00
9	Iron Bars,	9 00
4	Stone Hammers,	6 00
1	Ox Wagon,	40 00
2	Horse Wagons,	70 00
3	Ox Carts,	70 00
2	Horse Carts,	35 00
3	Stone Drags,	5 00
6	Ploughs,	30 00
4	Harrows,	15 00
3	Cultivators,	10 00
2	Hand Cultivators,	4 00
8	Ox Yokes,	15 00
10	Draft Chains,	10 00
4	Stake Chains,	3 00
4	Trace Chains,	2 00
2	Ox Sleds,	7 00
2	Horse Sleds,	12 00
1	Buggy Wagon,	20 00

1	Sleigh,	$25 00
	Stable Utensils, including Buffaloes,	15 00
	Articles in Tool House,	10 00
1	Iron Roller,	20 00
	Lot of Harness,	65 00
1	Fanning Mill,	12 00
4	Door Chains,	1 00
1	Seed Sower,	5 00
	Scales and Steelyards,	21 00
128	Bushels Potatoes,	76 80
1	Ton Guano,	54 00
100	Strawberry Boxes,	3 00
40	Hand Hoes,	12 00
1	Drill,	2 00
8	Wheelbarrows,	8 00
	Lot Measures and Grass Shears,	2 00
1	Beetle and Wedges,	2 00
2	Water Cans,	1 00
3	Bog Hooks,	4 00
9	Axes,	5 00
4	Wood Saws,	4 00
3	Ice Hooks,	1 00
	Ice Tongs,	2 00
2	Cross-cut Saws,	5 00
2	Hand Saws,	1 00
8	Baskets,	4 00
6	Grass Scythes,	2 00
12	Grass Snaths,	6 00
1	Grindstone,	7 00
6	Bush Scythes,	4 00
2000	Clear Lumber,	80 00
500	Spruce Lumber,	10 00
200	Pounds Nails,	9 75
3	Buckets,	0 75
1	Surveyor's Chain,	2 00
1	Iron Ox Shovel,	6 50
1	Spirit Level,	2 00
1	Swill Cart,	42 35
1	Refrigerator,	11 00
		$6,471 91

[B.]

Inventory of Stock, Crops, Tools, &c., at the State Farm at Westboro', December 1, 1855.

5	Yoke Oxen,		$845 00
20	Cows,		715 00
1	Jersey Cow, Alice,	$150 00	
1	Hereford Cow,	175 00	
1	Hereford Heifer,	130 00	
2	Jersey Bulls,	100 00	
			555 00
3	Horses—Billy, $170; Charlie, $190; Cate, $130,		490 00
2	Breeding Sows and 18 Pigs,		67 00
16	Shotes, at $12,		192 00
13	Fatting Hogs,		325 00
2	Boars,		35 00
8	Young Breeding Sows,		100 00
72	Tons English Hay on hand, at $18,		1,296 00
27	" Meadow Hay on hand, at $9,		243 00
5	" Straw, on hand, at $10,		50 00
30	" Corn Fodder, on hand, at $6,		180 00
982	Bushels Indian Corn, on hand,		1,145 67
380	" Oats, on hand,		190 00
120	" Rye, on hand,		160 00
48	Tons Carrots, on hand,		576 00
350	Cabbages,		10 50
854	Bushels Ruta Bagas,		170 80
208	" Beets,		52 00
140	" English Turnips,		140 00
42	" Parsnips,		14 00
100	" Onions,		67 00
140	" Potatoes,		70 00
3	Hay Cutters,		37 50
1	Feed Trough,		4 00
13	Hay Forks,		4 00
32	Hay Rakes,		4 00
25	Manure Forks,		20 00
100	Shovels,		40 00
13	Spades,		13 00
30	Picks,		30 00
2	Manure Hooks,		1 00
15	Iron Bars,		15 00
4	Stone Frames,		6 00
1	Ox Wagon,		40 00

1	Horse Wagon,	$40 00
1	" "	30 00
1	" "	30 00
2	Horse Carts,	40 00
3	Ox Carts,	70 00
1	Stone Elevator,	160 00
4	Stone Drags,	5 00
8	Ploughs,	32 00
3	Harrows,	13 00
2	Cultivators,	10 00
2	Hand Cultivators,	4 00
8	Ox Yokes,	16 00
11	Ox Chains,	15 00
4	Stake Chains,	2 00
2	Ox Sleds,	7 00
2	Horse Sleds,	12 00
1	Buggy,	5 00
1	Sleigh,	25 00
	Harnesses,	50 00
	Stable Utensils, &c.,	15 00
	Articles in Tool Room,	10 00
1	Iron Roller,	20 00
	Tanning Mill and Corn Sheller,	10 00
1	Seed Sower,	5 00
	Steel Yards and Balances,	20 00
50	Strawberry Boxes,	1 50
49	Hand Hoes,	16 00
8	Drills,	8 00
16	Wheelbarrows,	40 00
	Beetle and Wedges,	2 00
	Measures and Grass Shears,	2 00
9	Iron Rakes,	3 00
4	Water Cans,	2 00
3	Bog Hooks,	4 00
6	Axes,	3 00
5	Wood Saws,	5 00
3	Ice Hooks,	1 00
	Ice Tongs,	2 00
2	Cross-cut Saws,	5 00
2	Hand Saws,	1 00
20	Baskets,	8 00
4	Scythes,	2 00
12	Snaths,	6 00
	Grindstone,	5 00
6	Bush Scythes,	4 00
8	Pails,	1 00
	Spirit Level,	2 00
1	Scraper,	6 00
1	Swill Cart,	40 00
	Refrigerator,	10 00

	Lumber, clear,	$80 00
	Lumber, common,	10 00
	Surveyor's Chain,	2 00
14	Corn Cutters,	2 00
2	Derricks,	50 00
	Garden Reel,	1 00
	Phosphates,	6 00
4	Bushels Seed Beans,	8 00
16	Meal Bags,	4 00
	Household Furniture,	137 15
	Total,	$9,028 62

CASH ACCOUNT OF THE TREASURER.

Dr. *C. L. Flint in Account with the State Board of Agriculture.* *Cr.*

1855.			1855.		
Dec. 1,	To cash on hand, December 1, 1854, . .	$404 13	Nov. 30,	By cash paid farm expenses, ...	$1,757 16
	" cash received from State Treasurer, . .	6,000 00	" "	" cash paid farm labor, &c., ...	2,393 88
Oct. 9,	" cash received from Treas. State Ref. School,	213 25	" "	" cash paid S. N. White for labor, . . .	375 00
Nov. 16,	" cash received from Treas. State Ref. School,	300 00	" "	" cash paid S. N. White for board, &c., . .	615 69
" 30,	" cash received from Treas. State Ref. School,	478 60	" "	" cash paid for fertilizers, ...	282 32
" 30,	" cash S. N. White, ...	15 16	" "	" cash paid for transportation, ...	133 73
" 30,	" cash S. N. White, ...	27 26	" "	" cash paid for repairs, ...	101 74
" 30,	" farm, ...	16 50	" "	" cash paid for stock, ...	831 35
			" "	" cash, bills payable, ...	200 00
			" "	" cash, miscellaneous, ...	27 00
			" "	" paid J. C. Gilman for rent of farm, . .	591 00
			" "	" cash on hand Dec. 1, 1855, ...	146 03
		$7,454 90			$7,454 90

Dr. *State Board of Agriculture in account with the Commonwealth.* *Cr.*

To personal estate inventory, 1854,	$6,471 91	By personal estate inventory,	$9,028 62
" cash on hand, Dec. 1, 1854,	404 13	" paid for labor,	4,295 93
" cash received of State Treasurer,	6,000 00	" paid for farming utensils,	563 20
" cash received of Treas. State Ref. School, old account,	1,204 24	" paid for permanent improvements,	3,349 10
" received of Treas. State Reform School for labor,	550 10	" paid for interest,	15 94
" received for produce sold State Reform School,	1,789 53	" paid for fertilizers,	282 32
" received for milk sold State Reform School,	981 56	" paid for transportation,	145 62
" received for pork sold State Reform School,	414 18	" paid for miscellaneous,	71 97
" received for beef sold State Reform School,	456 21	" paid for farm stock,	831 35
" received for veal sold State Reform School,	18 26	" paid for repairs,	273 50
" received for hides and tallow, &c.,	10 91	" paid for grain,	542 27
" received of S. N. White, for produce,	453 75	" paid for board of men,	307 61
" received of S. N. White, for veal, &c.,	101 70	" paid for seed,	33 24
" received of S. N. White, for hides,	22 86	" paid for stationery,	9 85
" received of S. N. White, for pigs and pork,	85 05	" paid for potatoes,	25 35
" received of S. N. White, for milk,	21 87	" paid for thermometer and clock,	4 50
" received interest of J. C. Gilman,	9 00	" paid for straw,	51 29
" received of Otis Vinton,	6 25	" paid J. C. Gilman, for rent of farm,	600 00
" received of A. M. Brigham,	57 23	" paid State Reform School, for swill,	350 00
" received of T. A. Smith,	70 76	" paid for pasturing cattle,	110 65
" cash,	16 50	" paid for rent of land,	50 00
" received of S. N. White, for labor,	3 30	" paid Dr. Dadd,	7 00
" received for lead,	1 30	" paid for analysis of hay,	30 00
" Bills due, unpaid	299 73	" paid State Reform School, for sundries,	28 50
" Balance, Dec. 1, 1855,	2,411 27	" paid for sundries,	38 80
		" paid for furniture,	137 15
		" paid for surveys and plans,	350 00
		" out-standing bills,	181 87
		" cash on hand, Dec. 1, 1855,	146 03
	$21,861 60		$21,861 60

METEOROLOGICAL OBSERVATIONS

MADE BY JOHN BROOKS, PRINCETON, MASS., AT 7, 2 AND 9 O'CLOCK OF EACH DAY OF THE YEAR,

1855.

JANUARY—METEOROLOGICAL OBSERVATIONS.

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.						WIND. Direction and force. 10 = hurricane.			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.		2 P. M.		9 P. M.		7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths.	Amount of Snow in inches and hund'ths.
1	16	20.2	15	1	–	–	–	–	–	N.W.[1]	N.E.[1]	N.E.[1]	–	–	–	–
2	12	17.5	11	10	–	10	–	10	–	E.[2]	E.[1]	E.[1]	–	–	–	–
3	22.5	31	31	10	–	10	–	10	–	do.[1]	W.[1]	S.W.[2]	–	–	–	–
4	32	36.5	38	10	–	10	–	10	–	S.W[3]	S.W.[1]	S.[1]	11 P.M.	12 P.M.	.06	–
5	34	33.5	26	3	–	1	–	3	–	N.E.[1]	N.E.[1]	E.[2]	–	–	–	–
6	17.5	20.5	23.5	10	–	10	–	10	–	E.[1]	E.[1]	N.E.[2]	–	–	–	–
7	39.5	48	46	10	–	10	–	10	–	S.[2]	S.W.[2]	S.W.[2]	8½ P.M.	9½ P.M.	.09	–
8	31	32.2	27	7	N.W.[1]	1	–	–	–	N.W.[1]	N.W.[1]	N.W.[1]	–	–	–	–
9	26	34	31	10	E.[1]	10	–	10	–	E.[1]	S.W.[1]	do.[2]	–	–	–	–
10	29	37	13	6	N.W.[1]	–	–	1	–	N.W.[1]	N.W.[1]	do.[1]	–	–	–	–
11	13	21	23.3	8	–	10	S.E.[1]	10	–	S.E.[1]	S.E.[1]	S.E.[1]	2 P.M.	9 P.M.	.13	1 inch snow.
12	27	31.5	33	10	–	3	N.W.[1]	10	N.W.[1]	W.[1]	N.W.[1]	N.W.[1]	–	–	.02	–
13	35	44	28	10	–	10	–	8	do.[2]	S.E.[2]	S.[2]	do.[3]	–	–	–	–
14	7	8	5	–	–	–	–	–	–	N.W.[3]	N.W.[2]	do.[1]	–	–	–	–
15	8	23	24.3	5	W.[1]	10	W.[1]	10	–	S.W.[1]	W.[1]	S.W.[1]	–	–	–	–
16	23	22.7	19	10	–	10	–	10	–	E.[1]	E.[1]	E.[2]	–	–	–	–
17	16.5	19	22	10	–	10	–	10	–	do.[1]	N.E.[1]	N.E.[1]	9 A.M.	2 P.M.	.44	2 in's. snow.
18	28	32	29.5	10	–	10	–	10	–	N.E.[2]	do.[1]	do.[2]	–	–	–	–
19	26.4	25	25	10	–	10	–	10	–	N.W.[4]	N.W.[4]	N.W.[4]	3 A.M.	9 P.M.	1.10	8 in's. snow.
20	21.7	26	21	5	W.[1]	4	W.[1]	1	–	W.[2]	W.[1]	W.[1]	–	–	–	–
21	21	25	30	3	–	10	–	10	–	N.W.[1]	E.[1]	E.[2]	10 P.M.	–	–	–
22	48	38	23	10	–	8	W.[1]	–	–	S.[2]	W.[3]	W.[2]	–	2 P.M.	2.00	–
23	17	22.5	13.5	8	W.[1]	2	–	–	–	W.[1]	do.[1]	do.[1]	–	–	–	–
24	22.5	19	15	3	–	10	–	10	–	do.[1]	E.[1]	E.[1]	–	–	–	–
25	16	22	17	–	–	–	–	–	–	N.E.[1]	N.E.[1]	W.[1]	–	–	–	–
26	17	28	27	10	–	10	–	10	–	E.[2]	E.[3]	E.[2]	–	–	–	–
27	16	20	15.5	4	W.[1]	8	W.[1]	8	W.[1]	W.[2]	W.[3]	W.[1]	–	–	–	–
28	15	22.7	23	8	do.[1]	10	–	10	–	do.[1]	E.[1]	E.[2]	10 A.M.	–	–	–
29	43	44	28	10	–	8	W.[1]	–	–	E.[1]	W.[1]	W.[2]	–	5 A.M.	1.40	–
30	19	26 5	18.5	–	–	2	do.[1]	10	W.[1]	W.[1]	do.[1]	do.[1]	–	–	–	–
31	18.5	26.5	23	7	W.[1]	10	do.[1]	4	N.W.[1]	do.[1]	do.[1]	N.W.[1]	–	–	–	–
													Total, ...		5.24	11 in's snow.

FEBRUARY—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10 = hurricane.			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths.	Amount of snow in inches and hund'ths.
1	14.5	16	14	10 E.[1]	10 –	6 W.[1]	E.[1]	E.[1]	W.[1]	–	–	–	–
2	8	20	21	– –	8 W.[1]	10 –	W.[1]	W.[2]	S.W.[1]	–	–	–	–
3	18	20	10	10 W.[1]	8 do.[1]	– –	do.[1]	do.[1]	N.W.[1]	–	–	–	–
4	6.5	8	0	8 do.[1]	10 do.[1]	– –	do.[1]	do.[3]	W.[1]	–	–	–	–
5	1.5	9	2.5	10 –	4 N.W.[1]	5 N.W.[1]	E.[1]	N.W.[1]	N.W.[1]	–	–	–	–
6	15.5	15.5	18	– –	– –	– –	N W.[2]	do.[1]	do.[1]	–	–	–	–
7	16.7	4	2	– –	3 –	10 –	N.E.[1]	N E.[1]	N E.[3]	8 P.M.	–	–	–
8	7	13	15	10 –	10 –	10 –	do.[3]	do.[3]	do.[4]	–	–	–	–
9	12.5	15	11.5	10 –	8 N.E.[2]	10 N.E.[1]	do.[2]	do.[2]	do.[1]	–	8 A.M.	2.50	12 inches.
10	11	15	10	2 N.[3]	1 –	– –	N.[3]	N.W.[2]	N.W.[1]	–	–	–	–
11	10.5	18.5	13	3 W.[1]	9 W.[1]	– –	W.[1]	S.W.[1]	do.[1]	–	–	–	–
12	13	21	17	– –	– –	2 –	N.[1]	N.E.[1]	N.E.[1]	–	–	–	–
13	16	26	26	6 N.E.[1]	– –	– –	N.E.[1]	do.[1]	do.[1]	–	–	–	–
14	23	28	30	10 –	10 –	10 –	do.[1]	E.[1]	E.[3]	11 A.M.	–	–	–
15	34.7	36.5	31.5	10 –	10 –	10 –	E.[1]	do.[2]	do.[2]	–	8 P.M.	2.90	–
16	34	36	33	10 –	10 –	10 –	do.[1]	N.E.[1]	do.[1]	–	–	–	–
17	30.5	35	29	10 –	10 –	3 –	do.[1]	N.[1]	N.W.[2]	–	–	–	–
18	25	32.7	28	4 N.W.[2]	3 N.W.[3]	3 N.W.[2]	N.W.[2]	N.W.[3]	do.[2]	–	–	–	–
19	27	30	24	8 W.[1]	5 W.[1]	5 W.[1]	W.[2]	W.[2]	W.[2]	–	–	–	–
20	25	29	24	10 do.[1]	10 N.W.[1]	9 N.W.[1]	do.[2]	N.W.[3]	N.W.[3]	–	–	–	–
21	26.5	31.5	25.5	2 –	5 do.[1]	8 do.[1]	N.W.[2]	do.[2]	do.[2]	–	–	–	–
22	23	31.3	29.7	– –	4 W.[1]	10 do.[2]	do.[2]	W.[1]	do.[1]	–	–	–	–
23	24	15.5	16	9 W.[1]	10 –	– –	W.[1]	N.W.[2]	d [1]	–	–	–	–
24	2	7.5	5	– –	– –	– –	do.[1]	do.[2]	do.[2]	–	–	–	–
25	2	9	5.5	– –	5 N.W.[4]	– –	N.W.[2]	do.[4]	W.[3]	–	–	–	–
26	4.5	13.8	11	4 W.[2]	9 W.[1]	9 W.[2]	W.[3]	W.[2]	do.[2]	–	–	–	–
27	8	18	12	7 do.[1]	2 N.W.[2]	– –	do.[1]	N.W.[2]	N.W.[2]	–	–	–	–
28	8	20	13.8	1 –	1 –	1 –	N.W.[1]	do.[1]	do.[2]	–	–	–	–
										Total, ...		5.40	12 inches.

MARCH—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10 = hurricane.			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths.	Amount of snow in inches and hund'ths.
1	10	24.8	17.5	– –	1 –	– –	N.W.[1]	N.W.[1]	W.[2]	–	–	–	–
2	18	34	26	2 –	5 N.W.[1]	– –	do.[1]	do.[1]	S.W.[1]	–	–	–	–
3	21.7	39	32	6 W.[1]	5 W.[1]	9 W.[1]	W.[1]	W.[1]	W.[2]	–	–	–	–
4	31	31	27.5	6 do.[1]	1 –	5 N.W.[1]	do.[1]	N.W.[2]	N.[1]	–	–	–	–
5	33 5	44	38.5	5 do.[1]	10 W.[1]	10 –	S.W.[3]	W.[2]	S.[2]	8 P.M.	9½ P.M.	.09	–
6	39.5	36	28	7 do.[3]	6 do.[2]	2 W.[1]	do.[3]	do.[3]	N.W.[2]	–	–	–	–
7	17.3	26	21	3 –	8 E.[1]	10 E.[1]	N.[1]	E.[1]	E.[1]	–	–	–	–
8	26	27.6	24	5 N.E.[1]	– –	– –	N E.[1]	N.W.[1]	N.W.[1]	–	–	–	–
9	22.5	38	32	10 –	8 W.[1]	10 –	W.[1]	W.[1]	N.W.[1]	–	–	–	–
10	21.5	23	22.5	5 N.W.[1]	5 N.W.[1]	10 –	N.W.[3]	N.W.[3]	N.W.[3]	6 A.M.	8 A.M.	.02	¼ inch.
11	20.5	36.5	28	3 do.[1]	1 –	– –	do.[1]	N.E.[1]	N.E.	–	–	–	–
12	29.5	30	26	10 do.[1]	10 N.E.[1]	– –	do.[1]	do.[1]	N.W.[2]	–	–	–	–
13	25	31	26	8 W.[1]	10 E.[1]	10 –	N.E.[1]	E.[1]	E [2]	5 P.M.	10 P.M.	.35	2 inches.
14	26	23.7	18.5	10 –	10 do.[1]	10 –	E.[2]	do.[1]	do.[1]	–	–	–	–
15	18.5	29	32	10 –	10 –	– –	do.[1]	do.[1]	W.[2]	in night.	8 A.M.	.25	1 inch.
16	30.5	37.2	29	9 W.[1]	8 W.[1]	– –	W.[2]	W.[1]	do.[1]	–	–	–	–
17	30	29.5	29.5	10 –	10 S.W.[1]	10 –	N.E.[1]	S.E.[1]	S.E.[1]	1 P.M.	4 P.M.	.05	–
18	30	34.5	30	3 W.[1]	5 W.[3]	2 –	N.W.[1]	W.[3]	N.W.[2]	–	–	–	–
19	24	35	23	– –	1 –	– –	do.[1]	S.W.[1]	W.[1]	–	–	–	–
20	31	28.5	23	10 S.[1]	8 W.[1]	– –	S.[2]	W.[1]	do.[1]	6 A.M.	8 A.M.	.15	1 inch.
21	21.5	31	23	– –	– –	– –	W.[2]	do.[1]	do.[1]	–	–	–	–
22	19.5	29.5	24	8 N.[1]	10 W.[1]	10 N.W.[1]	N.[1]	do.[1]	N.W.[2]	–	–	–	–
23	18	32	31	1 –	3 do.[1]	4 S.W.[3]	W.[2]	S.W.[3]	S.W.[3]	–	–	–	–
24	32	28	11.5	7 W.[2]	10 do.[2]	– –	do.[2]	W.[2]	N.W.[2]	–	–	–	–
25	17	25	25	4 N.W.[3]	3 do.[2]	10 W.[3]	N.W.[3]	do.[4]	W.[3]	–	–	–	–
26	25	33	28	10 –	10 S.W.[3]	10 –	W.[2]	S.W.[3]	S.W.[1]	1½ P.M.	9 P.M.	.23	2 inches.
27	25	30	25.5	3 W.[1]	– –	– –	do.[1]	W.[1]	W.[1]	–	–	–	–
28	19.5	27	21	6 do.[1]	8 W.[1]	3 W.[1]	do.[1]	do.[2]	do.[2]	–	–	–	–
29	23	34.5	31	8 do.[1]	4 do.[1]	– –	do.[1]	do.[2]	do.[1]	–	–	–	–
30	32	45	38.7	8 do.[1]	– –	6 W.[1]	do.[1]	do.[1]	do.[1]	–	–	–	–
31	38	54	40.5	10 do.[1]	3 –	10 S.W.[2]	do.[1]	do.[1]	S.W.[2]	–	–	–	–
										Total rain, ...		1.14	6¼ inches.

APRIL—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10 = hurricane.			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths.	Amount of snow in inches and hund'ths.
1	37	38	20	10 N.E.^{1}	10 N.W.^{2}	5 W.^{3}	N.E.^{1}	N.W.^{2}	W.^{4}	–	–	–	–
2	13.5	19	21	5 N.W.^{4}	10 W.^{1}	– –	N.W.^{4}	W.^{4}	N.W.^{4}	–	–	–	–
3	19.8	31	28	3 –	2 –	8 W.^{1}	do.^{3}	do.^{3}	W.^{1}	–	–	–	–
4	27	43.5	36.7	6 W.^{1}	8 W.^{1}	3 –	W.^{1}	do.^{1}	S.W.^{1}	–	–	–	–
5	33	47	38	5 –	10 S.W.^{1}	10 –	do.^{2}	S.W.^{2}	N.E.^{1}	in night.	–	.50	–
6	36	49.2	40.3	10 N.W.^{1}	6 W.^{2}	5 N.W.^{2}	N.W.^{1}	W.^{2}	N.W.^{2}	–	–	–	–
7	27.5	35	28.5	3 do.^{2}	– –	– –	do.^{2}	do.^{1}	W.^{1}	–	–	–	–
8	32	44	34.3	1 –	1 –	– –	S.W.^{1}	S.W.^{1}	S.W.^{1}	–	–	–	–
9	35	46.2	35	1 S.W.^{2}	9 S.W.^{3}	– –	do.^{2}	do.^{3}	do.^{1}	3 P.M.	3½ P.M.	.69	–
10	35.8	45.7	36	1 –	10 W.^{2}	10 –	W.^{1}	W.^{1}	S.E.^{1}	–	–	–	–
11	31	35.8	33	10 N.E.^{1}	10 –	10 –	N.E.^{1}	N.W.^{1}	N.W.^{1}	in night.	11 P.M.	1.30	6 inches.
12	32.2	38.5	33.8	10 N.W.^{2}	5 N.^{3}	– –	N.W^2	N.^{3}	do.^{1}	–	–	–	–
13	29.5	43.8	39	– –	6 N.W.^{1}	10 –	do.	N.W.^{1}	W.	–	–	–	–
14	35.3	42	41.5	10 –	10 S.W.^{2}	10 W.^{2}	S.^{1}	S.W.^{2}	do.^{1}	11½ A.M.	12 M.	.10	–
15	43.3	44.8	40.2	10 –	10 N.W.^{2}	– –	N.W.^{1}	N.W.^{1}	N.W.^{1}	–	–	–	–
16	43	60.5	46	– –	– –	– –	do.^{1}	W.^{1}	W.^{1}	–	–	–	–
17	48	60	44	5 W.^{1}	10 W.^{1}	10 –	W.^{1}	do.^{2}	do.^{1}	–	–	–	–
18	44.7	64.5	51.2	10 do.^{1}	5 do.^{1}	10 –	do.^{1}	do.^{1}	do.^{1}	7 P.M.	8 P.M.	.20	–
19	49	65.5	47.5	10 do.^{1}	9 do.^{1}	10 –	do.^{1}	do.^{1}	S.W.^{1}	–	–	–	–
20	36	34	34	10 N.E.^{1}	10 N.E.^{1}	10 N.E.^{1}	N.E.^{1}	N.E.^{2}	N.E.^{2}	7 A.M.	12 M.	1.76	–
21	37	57.3	45	– –	1 –	– –	W.^{1}	W.^{1}	W.^{1}	–	–	–	–
22	41.8	52	48.5	5 W.^{1}	5 S.W.^{2}	4 N.W.^{1}	do.^{1}	S.W.^{2}	do.^{1}	–	–	–	–
23	45.5	59.5	45.5	– –	– –	– –	E.^{1}	W.^{1}	S.W.^{1}	–	–	–	–
24	45	67.2	55	1 –	3 S.W.^{1}	7 N.W.^{1}	N.W.^{2}	S.W.^{1}	do.^{1}	–	–	–	–
25	54	65	44	3 W.^{1}	10 E.^{1}	5 N.E.^{1}	W.^{1}	E.^{1}	N.E.^{1}	–	–	–	–
26	38.3	42.8	44.5	10 –	10 S.E.^{1}	10 W.^{2}	S.E.^{1}	S.E.^{1}	W.^{2}	2 P.M.	2½ P.M.	.05	–
27	37	49	39.5	– –	3 N.W.^{1}	2 N.W.^{1}	W.^{1}	N.W.^{3}	N.W.^{1}	–	–	–	–
28	34	45.8	40.5	– –	1 –	10 W.^{1}	N.W.^{2}	do.^{2}	W.^{1}	–	–	–	–
29	32	34	34.5	10 S.E.^{1}	10 S.E.^{1}	10 S.E.^{1}	S.E.	S.E.^{1}	S.E.^{1}	6 A.M.	12 M.	.06	–
30	34	39	37	10 E.^{1}	10 –	10 –	E.^{1}	N.E.^{1}	N.E.^{1}	–	–	–	–
										Total, ...		4.66	6 inches.

MAY—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10 = hurricane.			RAIN AND MELTED SNOW.			Amount of snow in inches and hund'ths.
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths.	
1	43.7	60	39	10 W.[1]	10 N.E.[1]	10 –	W.[1]	N.E.[1]	N.E.[1]	–	–	–	–
2	43	63	47	10 do.[1]	1 –	– –	do.[1]	W.[1]	W.[1]	–	–	–	–
3	42	59	52.7	1 –	10 W.[1]	1 –	N.E.[1]	N.W.[1]	N.W.[1]	–	–	–	–
4	42	39	52	2 –	10 do.[1]	5 W.[1]	do.[1]	W.[1]	W.[1]	5 P.M.	–	.21	–
5	47	57	50.3	5 –	5 N.[1]	– –	do.[2]	N.[2]	N.[2]	–	–	–	–
6	52	62	48	5 N.W.[1]	5 N.W.[2]	– –	N.[1]	N.W.[2]	do.[2]	–	–	–	–
7	36.8	52	42	3 do.[1]	– –	– –	do.	S.E.[1]	S.E.[1]	–	–	–	–
8	38.5	43	36	10 N.E.[1]	10 E.[3]	10 –	N.E.[1]	E.[3]	N.E.[3]	3 P.M.	–	–	–
9	36	39.3	35	10 do.[2]	9 N.E.[3]	10 N.E.[1]	do.[3]	N.E.[3]	do.[1]	–	in night.	.34	–
10	41	54	48.5	5 do.[1]	8 E.[1]	– –	do.[1]	E.[1]	do.[1]	–	–	–	–
11	45.5	60.5	50	10 W.[1]	10 N.W.[1]	5 S.[1]	W.[1]	N.W.[2]	S.[1]	–	–	–	–
12	48.5	66.2	54.5	5 N.W.[1]	5 –	– –	N.W.[1]	S.W.[2]	do.[1]	–	–	–	–
13	46	68.7	56.5	– –	2 W.[1]	10 –	N.E.[1]	S.[1]	S.W.[2]	–	–	–	–
14	54.7	60	54	10 –	10 do.[1]	8 W.[1]	W.[2]	W.[2]	W.[1]	–	–	–	–
15	54	73	67	7 W.[2]	8 do.[1]	– –	do.[1]	S.W.[2]	S.W.[2]	–	–	–	–
16	65	74.5	59	5 do.[2]	5 do.[1]	10 –	S.W.[2]	do.[2]	S.[1]	5½ P.M.	–	–	–
17	51	58	50	3 do.[2]	2 N.W.[1]	– –	N.W.[2]	N.[2]	N.[2]	–	in night.	.35	–
18	56.6	67.5	51.5	2 N.W.[1]	2 –	– –	N.E.[1]	S.	S.W.[2]	–	–	–	–
19	50.5	61	47	2 S.[1]	10 S.E.[1]	10 –	S.E.[1]	S.E.[2]	N.E.[1]	8 P.M.	in night.	.18	–
20	45.5	54.5	48	10 N.E.[2]	9 N.E.[3]	10 N.E.[1]	N.E.[2]	N.E.[3]	do.[1]	–	–	–	–
21	42.5	41	44.5	1 –	10 N.[1]	10 N.[1]	N.[2]	N.[3]	N.[2]	–	–	–	–
22	42	47	44	10 N.E.[1]	10 N.E.[1]	9 –	N.E.[1]	N.E.[1]	S.E.[1]	–	–	–	–
23	47.5	57.4	43	10 N.W.[1]	7 N.W.[1]	– –	N.W.[1]	do.[1]	do.[1]	–	–	–	–
24	48.4	77	63	9 S.W.[3]	6 W.[2]	1 –	S.W.[2]	W.[2]	S.W.[3]	–	–	–	–
25	58.5	69	57	9 W.[2]	5 do.[1]	– –	N.E.[1]	N.W.[1]	N.W.[2]	–	–	–	–
26	45	54	46	– –	1 N.[2]	1 –	N.[2]	do.[3]	N.[2]	–	–	–	–
27	46.3	61.5	57	1 –	– –	– –	N.W.[2]	N.[3]	do.[2]	–	–	–	–
28	54	66	51	– –	1 N.W.[1]	1 S.W.[1]	N.E.[1]	N.E.[1]	S.W.[1]	–	–	–	–
29	49.6	71.5	54	9 S.W.[3]	4 W.[1]	– –	S.W.[2]	W.[1]	do.[1]	–	–	–	–
30	53	73	59	9 W.[1]	– –	– –	W.[2]	do.[2]	W.[2]	–	–	–	–
31	58	72.8	59	1 do.[1]	7 W.[2]	3 S.W.[1]	do.[2]	do.[3]	S.W.[2]	–	–	–	–
										Total, ...		1.08	–

JUNE—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10= hurricane.			RAIN AND MELTED SNOW.			Amount of snow in inches and hund'ths.
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths.	
1	57.5	68	59.7	10 S.W.^{3}	9 S.W.^{3}	9 S.W.^{3}	S.W.^{3}	S.W.^{3}	S.W.^{3}	–	–	–	–
2	60	63	60.5	10 do ^{2}	10 do.^{3}	10 do.^{3}	do.^{2}	do.^{3}	do.^{2}	in night.	–	–	
3	61	63.8	58	10 S.^{3}	10 S.^{2}	10 S.^{2}	S.^{3}	S.^{3}	S.^{1}	–	2 P.M.	.61	
4	57	68	48	10 do.^{2}	6 W.^{1}	– –	do.^{2}	W.^{1}	W.^{1}	in night.	in night.	.12	–
5	48	52	48	2 W.^{1}	10 do.^{1}	– –	W.^{2}	do.^{1}	do.^{1}	–	–	–	–
6	52.5	65	57.5	– –	8 do.^{1}	10 W.^{1}	do.^{1}	do.^{1}	do.^{1}	–	–	–	–
7	54.7	52	51.5	10 S.W.^{1}	10 –	10 –	S.W.^{1}	S.E.^{1}	S.E.	8½ A.M.	–	–	–
8	52.7	61.7	46.5	4 N.W.^{2}	4 W.^{3}	1 –	N.W^2	W.^{3}	W.	–	in night.	.93	–
9	51.5	62.5	57	6 W.^{1}	5 do.^{2}	5 W.^{1}	W.^{1}	N.W.^{2}	S.W.^{2}	–	–	–	–
10	53.8	70.5	62	10 S.W.^{1}	5 S.W.^{4}	10 S.W.^{3}	S.W.^{1}	S.W.^{3}	do.^{3}	in night.	–	–	–
11	57.5	63	51.2	10 do.^{2}	6 W.^{1}	– –	do.^{2}	W.^{2}	W.^{1}	–	8 A.M.	.06	–
12	47	58	48	10 do.^{2}	5 do.^{1}	– –	W.^{1}	do ^{1}	N.W.^{2}	6 A.M.	8 A.M.	.13	–
13	45	54	56.8	5 W.^{1}	5 do.^{1}	5 N.W.^{1}	N.W.^{1}	do.^{1}	do.^{1}	–	–	–	–
14	55	64.2	52	6 do.^{1}	6 N.W.^{1}	2 –	W.^{1}	do.^{1}	S.E.	–	–	–	–
15	50.5	59	57	5 do.^{1}	9 W.^{1}	3 –	do.^{1}	do.^{1}	N.W.^{1}	–	6½ P.M.	.04	–
16	55	72	53	– –	6 do.^{1}	9 W.^{1}	N.W.^{1}	do.^{1}	W.^{1}	–	–	–	–
17	55	67.5	58 5	1 –	– –	1 –	N.^{1}	N.^{1}	N.^{1}	–	–	–	–
18	57.5	67.8	52.5	– –	3 W.^{1}	2 –	E.^{1}	E.	S.W.^{1}	–	–	–	–
19	54	63	57	10 E.^{1}	8 do.^{1}	10 E.^{1}	do.^{1}	S.E.^{1}	E.^{1}	–	–	–	–
20	51	64.5	61	10 –	10 do.^{1}	10 W.^{1}	do.^{2}	W.^{1}	W.^{1}	in night.	8 A.M.	.31	–
21	59	72.5	64.5	– –	2 –	1 –	W.^{1}	do.^{1}	S.W.^{1}	–	–	–	–
22	64 5	78	62	6 S.W.^{1}	5 W.^{1}	9 W.^{1}	S.W.^{2}	S.W.^{2}	W.^{1}	7 P.M.	8 P.M.	.36	–
23	65.5	73	62.5	7 N.^{1}	4 N.W.^{1}	2 –	N.^{1}	N.E.^{1}	N.E.^{1}	–	–	–	–
24	66	66.5	59.5	6 W.^{1}	9 S.E.^{2}	10 E.^{1}	S.W.	S.E.^{2}	E.^{1}	–	–	–	–
25	57	62.5	59	10 –	10 –	10 –	S.E.^{1}	N.E.^{1}	N.E.^{1}	intervals	dur'g day.	1.40	–
26	64.5	75	61.8	10 –	10 W.^{1}	4 S.W.^{1}	S.W.^{1}	W.^{1}	S.W.^{1}	4 P.M.	4¼ P M.	.16	–
27	65	77	68	– –	3 do.^{1}	– –	W.^{1}	do.^{1}	do.^{1}	–	–	–	–
28	70.2	75.5	67	8 W.^{1}	10 do.^{2}	4 W.^{1}	do.^{1}	do.^{1}	W.^{1}	slight	showers.	.01	–
29	72	85.2	75	4 N.W.^{1}	3 N.W.^{2}	3 do.^{1}	N.W.^{2}	do.^{2}	do.^{1}	–	–	–	–
30	78	81.6	75	3 W.^{1}	6 W.^{1}	2 do.^{1}	do.^{2}	N.E.^{1}	do.^{1}	–	–	–	–
										Total rain, ...		4.13	

JULY—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10 = hurricane			RAIN AND MELTED SNOW.			Amount of snow in inches and hund'ths.
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths.	
1	77.2	85	75.5	1 –	– –	1 –	N.W.[1]	W.[1]	S.W.[1]	–	–	–	–
2	74	91	73	– –	10 W.[1]	7 W.[1]	W.[1]	do.[1]	do.[1]	2 P.M.	2.10 P.M.	.01	–
3	64	74.5	65	5 W.[1]	8 do.[1]	5 do.[1]	do.[1]	do.[1]	W.[1]	–	–	–	–
4	67	80	70	6 do.[2]	6 S.W.[2]	8 S.W.[2]	S.W.[1]	S.W.[2]	S.W.[2]	–	–	–	–
5	66.5	77	69.5	10 W.[2]	3 W.[1]	3 W.[1]	W.[2]	W.[1]	W.[1]	–	–	–	–
6	68	75.5	62.5	8 N.W.[1]	9 S.E.[3]	10 –	N.W.[1]	S.E.[3]	S.E.[1]	8 P.M.	11 P.M.	1.08	–
7	63	60	58	10 E.[3]	10 –	9 –	E.[1]	E.[2]	N.E.[2]	12½ P.M.	–	–	–
8	59.8	66	61.5	7 N.E.[2]	4 N.W.[1]	1 –	N.E.[1]	N.W.[1]	N.W.[1]	–	in night.	1.19	–
9	62.7	73	60	3 do.[1]	4 S.E.[1]	3 –	do.[1]	S.[1]	S.W.[1]	–	–	–	–
10	60	74	64	4 S.W.[3]	5 S.W.[2]	10 –	S.W.[2]	S.W.[2]	do.[1]	–	–	–	–
11	63	73	65.2	10 –	10 do.[1]	1 –	do.[1]	do.[1]	do.[1]	in night.	9 A.M.	.36	–
12	66.5	79	68	3 N.W.[1]	6 W.[1]	2 –	N.W.[1]	W.[1]	do.[1]	–	–	–	–
13	65	79	64	9 W.[2]	6 do.[2]	10 –	W.[1]	S.W.[2]	W.[2]	8 P.M.	–	–	–
14	63	79.3	64	1 –	4 do.[1]	3 –	N.W.[1]	N.E.[1]	N.E.	–	in night.	.45	–
15	66	76.5	63	2 W.[1]	5 do.[1]	1 –	W.[1]	S.E.[1]	S.E.	–	–	–	–
16	62.3	79	68	3 do.[1]	5 do.[1]	2 –	do.[1]	W.[1]	W.[1]	–	–	–	–
17	71	84.7	75	5 do.[2]	4 do.[1]	3 W.[1]	do.[1]	do.[1]	do.[1]	–	–	–	–
18	76	85	71.5	5 N.W.[1]	8 N.W.[1]	2 –	N.W.[1]	N.W.[1]	do.[1]	5½ P.M.	6¼ P.M.	.08	–
19	75.5	83.7	74.5	6 W.[1]	8 W.[1]	6 W.[1]	W.[1]	W.[1]	do.[2]	–	–	–	–
20	66.5	63	60	10 do.[1]	9 E.[1]	10 E.[1]	N.E.[2]	E.[1]	E.[1]	6 A.M.	11 A.M.	.33	–
21	54.8	61.5	55	10 N.E.[1]	10 do.[2]	9 N.[1]	do.[1]	do.[1]	N.[1]	showers.	–	.19	–
22	58	65	56.5	3 N.W.[2]	6 do.[2]	3 –	do.[2]	do.[1]	E.	–	–	–	–
23	56.3	62.6	60	10 E.[1]	10 do.[1]	10 –	E.	do.[1]	S.E.[1]	slight sh'r.	–	–	–
24	61.6	65.5	64.5	10 –	10 S.W.[1]	10 –	S.E.[1]	S.[1]	S.[1]	showers.	–	.33	–
25	70	78.5	74	10 W.[1]	8 W.[1]	1 –	W.[1]	W.[1]	W.[1]	–	..	–	–
26	75	76.7	68	5 do.[1]	10 N.E.[1]	10 –	N.W.[1]	N.E.[1]	do.[1]	4 P.M.	11 P.M.	1.44	–
27	70	71	62	3 N.W.[1]	7 do.[3]	3 –	W.[1]	do.[2]	S.E.[1]	–	–	–	–
28	61.5	69	63.2	10 E.[1]	9 S.E.[1]	10 S.E.[1]	E.[1]	S.E.[1]	do.[1]	–	–	–	–
29	62	67.3	65	10 do.[1]	10 E.[1]	10 E.[1]	do.[1]	E.[1]	E.[1]	in night.	–	.13	–
30	67	81.3	68.3	10 W.[1]	16 W.[1]	10 W.[1]	W.[1]	W.[1]	W.[1]	7 P.M.	–	–	–
31	65.5	73	71	10 do.[1]	5 N.E.[1]	9 E.[1]	do.[1]	N.E.[1]	E.	–	7 A.M.	.44	–
										Total, ...		6.03	–

AUGUST—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10 = hurricane.			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended	Amount of rain and melted snow in inches & hund'ths.	Amount of snow in inches and hund'ths.
1	68.5	77.2	65	10 E.[1]	8 E.[1]	1 –	E.[1]	E.[1]	E.	–	–	–	–
2	62.5	74	64	3 –	4 W.[1]	1 –	W.	S.E.[1]	S.W.[1]	–	–	–	–
3	61	75.5	64.3	1 W.[1]	1 –	1 –	do.[1]	W.[1]	do.[1]	–	–	–	–
4	61	79.5	66.5	3 do.[1]	6 W.[1]	9 W.[1]	do.[2]	do.[1]	W.[1]	3½ P.M.	4½ P.M.	.52	–
5	61.5	71.5	61.5	8 do.[1]	8 do.[1]	10 –	E.[2]	E.[1]	E.[1]	–	–	–	–
6	61.2	73.7	66	7 do.[1]	8 do.[1]	– –	do.[1]	N.E.[1]	N.[1]	shower in	night.	.07	–
7	63.5	71.5	58	3 do.[2]	4 do.[1]	9 W.[1]	N.E.[1]	S.W.[1]	do.[2]	7 P.M.	8 P.M.	.29	–
8	52.3	63	55	2 N.W.[2]	9 do.[1]	5 do.[1]	do.[1]	S.[2]	S.[1]	–	–	–	–
9	59.5	77.2	67	10 –	5 do.[3]	7 do[2]	S.E.[2]	N.W.[2]	W.[2]	3 A.M.	8 A.M.	.85	–
10	59.2	68.4	58	5 W.[2]	5 N.W.[3]	6 do.[1]	W.[2]	do.[3]	do.[2]	–	–	–	–
11	53	69	56	– –	1 –	1 –	N.[1]	S.E.[1]	N.E.	–	–	–	–
12	58	71	57.5	1 W.[1]	4 S.W.[1]	– –	W.[1]	S.W.[1]	S.W.[1]	–	–	–	–
13	64	70	67.8	10 do.[2]	10 W.[2]	6 W.[1]	do.[2]	do.[2]	W.[1]	–	–	–	–
14	66	74.3	66	– –	2 do.[1]	6 N.E.[1]	N.W.[1]	do.[1]	N E.[1]	–	–	–	–
15	60	71	62.4	2 S.W.[1]	5 do.[2]	8 S.[2]	N.E.[1]	S.W.[2]	S.[2]	–	–	–	–
16	71 5	78	68	8 W.[2]	10 do.[2]	8 S.W.[2]	W.[1]	W.[2]	S.W.[1]	3 P.M.	3½ P.M.	.07	–
17	71.5	75.3	62	9 S.W.[2]	7 do.[2]	3 W.[1]	S.W.[2]	S.W[2]	W.[2]	4 P.M.	4½ P.M.	.08	–
18	51.8	62	53	1 W.[1]	7 S.[2]	1 –	N.W.[2]	W.[2]	N.W.[1]	–	–	–	–
19	56	64	53	– –	1 –	– –	N.[2]	N.W.[1]	W.[1]	–	–	–	–
20	56.2	68	57.5	4 W.[1]	8 W.[1]	1 –	W.[1]	W.[1]	S.W.[2]	–	–	–	–
21	58.7	73	69	3 do.[2]	– –	6 S.W.[2]	do.[3]	do.[2]	do.[2]	–	–	–	–
22	59.5	75	65.7	4 do.[1]	8 W.[1]	10 W.[1]	do.[1]	do.[1]	W.[1]	–	–	–	–
23	66.5	75.5	67	10 –	10 do.[2]	10 do.[1]	S.W.[1]	do.[1]	do.[1]	shower.	–	.02	–
24	64.5	75.5	69.8	8 W.[2]	6 do.[2]	– –	W.[2]	N.W.[1]	N.W.[3]	–	–	–	–
25	67	72	59	1 –	4 N.E.[1]	1 –	N.E.[1]	E.[1]	E.	–	–	–	–
26	60	62	64.5	10 S.E.[1]	10 S.[1]	9 S.W.[2]	S.E.[1]	S.[1]	S.W.[2]	shower.	1 P.M.	.30	–
27	54	60	50	10 N.E.[2]	6 W.[2]	5 W.[1]	N.E.[3]	N.E.[2]	W.	–	–	–	–
28	53.5	62	50	1 –	– –	– –	E.[1]	E.[1]	S.E.[1]	–	–	–	–
29	50.5	68.5	58.5	– –	1 –	10 S.W.[1]	W.[1]	W.[1]	S.W.[1]	–	–	–	–
30	57	60.2	52	1 –	5 N.W.[1]	– –	N.W.[1]	N.W.[2]	N.W.[2]	–	–	–	–
31	45	61	51.5	– –	6 W.[1]	10 W.[1]	N.[1]	W.[1]	W.[1]	–	–	–	–
										Total, ...		2.20	–

SEPTEMBER—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10 = hurricane			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began	Hour ended	Amount of rain and melted snow in inches & hund'ths.	Amount of snow in inches and hund'ths.
1	58 7	68.4	69.5	10 W.^{2}	10 S.W.^{2}	8 S.W.^{2}	W.^{2}	S.W.^{2}	S.W.^{4}	–	–	–	–
2	61.5	72	57	10 S.W.^{2}	6 W.^{2}	1 –	S.W.^{3}	W.^{3}	W.^{2}	–	–	–	–
3	53	59	54	10 N.^{1}	10 do.^{1}	10 –	N.^{1}	do.^{1}	do.^{1}	–	–	–	–
4	53	55	50.5	– –	8 N.E.^{1}	– –	N.E.^{1}	N.E.^{1}	N.E.^{1}	–	–	–	–
5	61	69	57	– –	1 –	– –	W.^{1}	W.^{1}	W.^{1}	–	–	–	–
6	56.7	72.5	58	– –	– –	– –	N.W.^{1}	do.^{1}	N.E.^{1}	–	–	–	–
7	57	71.8	60	3 N W.^{1}	4 W.^{1}	5 S.W.^{2}	do.^{1}	S.W.^{2}	S.W.^{2}	–	–	–	–
8	59.5	78	70	7 W.^{1}	4 N.W.^{2}	6 W.^{2}	W.^{2}	N.W.^{2}	W.^{2}	–	–	–	–
9	68	79	66	5 N.W.^{2}	5 do.^{3}	– –	N.W.^{2}	do.^{3}	N.W.^{1}	–	–	–	–
10	57	72	62.5	4 do.^{1}	3 do.^{2}	1 –	N.^{1}	N.^{2}	N.^{2}	–	–	–	–
11	59	77	66	1 –	1 –	– –	do.^{1}	W.^{1}	N.W.^{1}	–	–	–	–
12	66	81.5	74	3 W.^{1}	4 W.^{1}	– –	W.^{1}	do.^{3}	S.W.^{2}	–	–	–	–
13	73.5	69	53.5	4 do.^{2}	8 N.W.^{2}	1 –	do.^{3}	N.W.^{2}	N.W.^{1}	–	–	–	–
14	50	61	59	1 –	3 W.^{1}	10 E.^{1}	N.E.^{2}	E.^{1}	E.^{1}	–	–	–	–
15	50	66	54	5 W.^{1}	1 –	– –	N.^{1}	W.^{1}	S.^{1}	–	–	–	–
16	57	65	61	5 do.^{1}	9 S.W.^{3}	– –	W.^{1}	do.^{2}	W.^{1}	in night.	in night.	.26	–
17	58.5	76	67	10 do.^{2}	4 W.^{2}	1 –	do.^{2}	do.^{2}	do.^{2}	–	–	–	–
18	67	77	50	7 do.^{2}	9 do.^{2}	9 –	do.^{3}	S.W.^{3}	N.^{2}	4 P.M.	4½ P.M.	.42	–
19	41	48	39.5	9 do.^{1}	1 –	– –	N.E.^{2}	N.^{1}	W.^{1}	–	–	–	–
20	41	56	44	– –	8 N.W.^{2}	1 –	W.^{1}	N.W.^{1}	N.W.^{1}	–	–	–	–
21	44	57.5	53	8 W.^{1}	10 W.^{1}	10 W.^{1}	do.^{1}	W.^{1}	W.^{1}	–	–	–	–
22	51	61.5	51	7 do.^{2}	8 N.E.^{1}	10 N.E.^{3}	N.E.^{2}	N.E.^{2}	N.E.^{2}	–	–	–	–
23	46	51.5	45	10 –	10 do.^{3}	10 do.^{1}	do.^{3}	do.^{3}	do.^{1}	–	–	–	–
24	44	56	46	1 –	1 –	7 do.^{1}	do.^{1}	do.^{1}	do.^{1}	–	–	–	–
25	49	62	49.5	9 N.W.^{1}	5 W.^{1}	– –	N.W.^{1}	W.^{1}	S.W.^{1}	–	–	–	–
26	56	71.5	70	10 S.W.^{1}	4 do.^{1}	10 S W.^{2}	S.W.^{1}	do.^{1}	do.^{2}	–	–	–	–
27	56	61	50	10 W.^{2}	8 do.^{2}	5 W.^{2}	W.^{1}	N.W.^{2}	N.W.^{2}	in night.	10 A.M.	.08	–
28	45	55.7	43	1 –	– –	– –	N.W.^{2}	do.^{2}	do.^{1}	–	–	–	–
29	46	60	48	– –	– –	– –	N.E.^{1}	S.^{1}	S.W.^{2}	–	–	–	–
30	47	69.5	54.5	10 –	8 S.E.^{3}	10 S.E.^{1}	S.E.^{1}	S.E.^{3}	S.E.^{1}	–	–	–	–
										Total, ...		.76	–

OCTOBER—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10=hurricane.			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended	Amount o rain and melted snow in inches & hund'ths	Amount of snow in inches and hund'ths.
1	53	65.5	55.7	10 –	10 E.[2]	10 –	N.E.[2]	E.[2]	E.[2]	3 A.M.	–	–	–
2	61	62	63	10 S.E.[2]	10 –	10 –	S.E.[3]	S E.[1]	S.E.[1]	–	–	1.52	–
3	60	69.7	60.5	10 –	8 S.W.[2]	10 S.W.[1]	E.[1]	S.W.[1]	S.W.[1]	–	11 A.M.	1.48	–
4	55	57	52	10 S W.[1]	10 W.[3]	10 –	S.W.[2]	W.[3]	W.[3]	5 P.M.	–	1.39	–
5	56	60	59	3 W.[1]	2 –	3 –	W.[3]	do.[2]	do.[1]	–	1 A.M.	.48	–
6	60	64.5	64	10 W.[1]	10 W.[2]	10 –	d .[1]	do.[2]	S.[4]	12 M.	–	–	–
7	44	58	39	1 –	1 –	– –	N.W.[2]	N.W.[1]	N.W.[2]	–	in night.	.85	–
8	36.5	52	44	– –	6 W.[1]	8 S.W.[1]	do.[1]	W.[1]	S.W.[1]	–	–	–	–
9	40	56	48	1 –	8 do.[2]	3 –	W.[1]	do.[2]	W.[1]	–	–	–	–
10	47	60.5	43.7	– –	5 N.W.[1]	– –	do.[1]	N.W.[1]	do.[1]	–	–	–	–
11	43.7	55.5	49	10 E.[2]	10 E.[2]	10 –	E.[1]	E.[1]	E.[1]	–	–	–	–
12	51.5	55.7	51	10 –	10 S.E.[2]	10 –	S.E.[1]	S.E.[1]	S.E.[2]	11 A.M.	7 P.M.	.35	–
13	49	48.5	39	10 S.W.[2]	3 S.W.[2]	2 –	S.W.[2]	S.W.[2]	S.W.[1]	–	–	–	–
14	38	47	42.5	7 W.[1]	9 do.[1]	10 –	E.[1]	S.E.[1]	N.E.[2]	6 P M.	9 P.M.	.48	–
15	37.5	49.5	44	4 do.[2]	– –	1 –	W.[2]	W.[1]	W.[1]	–	–	–	–
16	43	54.5	43	– –	8 W.[1]	5 N.W.[1]	N.W.[1]	do.[1]	N.[1]	–	–	–	–
17	34	46.2	35	1 –	– –	– –	W.[2]	do.[1]	N.W.[1]	–	–	–	–
18	33.5	52	46	3 W.[2]	– –	– –	do.[2]	do.[3]	W.[1]	–	–	–	–
19	49	63	52	7 do.[2]	– –	– –	do.[1]	E.[1]	S.E.[1]	–	–	–	–
20	50	49	58	9 do.[1]	10 S.W.[1]	10 –	S.W.[2]	S.W.[1]	N.E.[1]	–	–	–	–
21	54	55	54.5	10 –	10 –	10 –	N.E.[3]	N.E.[3]	N.[1]	in night.	1 P.M.	.44	–
22	53.5	53.5	43	7 W.[3]	10 W.[1]	6 W.[2]	W.[2]	W.[1]	W.[2]	–	–	–	–
23	41	50	42	7 N.W.[1]	4 do.[1]	10 S.W.[1]	N.W.[1]	do.[1]	S.W.[1]	8 P.M.	–	–	–
24	38.5	43	46	10 –	10 –	10 –	N.E.[2]	N.E.[2]	N.E.[1]	–	9 P.M.	1.30	–
25	37	40	33	10 W.[2]	5 W.[2]	4 W.[2]	W.[2]	W.[2]	W.[2]	–	–	–	–
26	33 7	42.7	42.5	5 do.[1]	8 do [1]	9 do.[1]	do.[1]	do.[1]	do.[1]	–	–	–	–
27	42	47	35	4 do.[1]	10 S.W.[2]	– –	do.[1]	S.W.[2]	S.W.[2]	–	–	–	–
28	35	38	35.5	10 S.W.[2]	8 N.[4]	3 N.W.[4]	do.[1]	N.[4]	N.W.[4]	in night.	in night.	.02	¼
29	29	43	35	1 –	– –	– –	N.W.[3]	W.[2]	W.[1]	–	–	–	–
30	44	49.3	40	9 S.W.[3]	8 W.[2]	– –	S.W.[4]	do.[2]	N.W.[2]	7 A.M.	2 P.M.	.14	–
31	37.5	47.5	40	1 N.W.[2]	3 do.[1]	3 –	N.[1]	S.W.[1]	S.W.[1]	–	–	–	–
										Total, ...		8.36	¼ inch.

NOVEMBER—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc			WIND. Direction and force. 10 = hurricane.			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths	Amount of snow in inches and hund'ths.
1	44	49	54	– –	8 W.^{2}	– –	S.^{1}	W.^{1}	N.E.^{1}	–	–	–	–
2	49	48	43	10 E.^{1}	10 N.E.^{2}	10 –	N.E.^{2}	N.E.^{2}	S.W.^{1}	–	–	–	–
3	40	39	37.5	10 N.^{1}	10 do.^{2}	10 –	E.^{2}	do.^{1}	N.E.^{2}	2 P.M.	–	–	–
4	38	39	37.5	10 N.E.^{2}	10 do.^{2}	2 –	N.E.^{2}	do.^{2}	do.^{1}	–	3 P.M.	1.54	–
5	32	42	38	1 do.^{2}	1 –	10 –	do.^{2}	E.^{2}	E.^{2}	–	–	–	–
6	38	43.5	41.5	10 E.^{3}	10 E.^{2}	10 E.^{2}	E.^{2}	do.^{2}	do.^{2}	–	–	–	–
7	40.5	45	45	10 do.^{2}	10 do.^{1}	10 do.^{1}	do.^{2}	do.^{1}	do.^{1}	–	–	–	–
8	47	53	43	10 W.^{2}	10 W.^{1}	– –	W.^{2}	W.^{1}	N.W.^{2}	–	–	.11	–
9	41.5	47	36	– –	3 N.^{1}	– –	N.W.^{2}	N.^{1}	N.^{1}	–	–	–	–
10	32.5	47	39	2 –	6 S.^{2}	2 S.^{1}	N.E.^{1}	S.^{1}	S.^{1}	–	–	–	–
11	42	53	46	5 W.^{1}	8 S.W.^{1}	10 –	W.^{1}	S.W.^{1}	N.E.^{2}	–	–	–	–
12	41	42	44	10 N.E.^{3}	10 N.E.^{3}	10 –	N.E.^{3}	N.E.^{3}	do.^{4}	6 A.M.	–	–	–
13	40	53	41	10 do.^{3}	1 –	– –	do.^{3}	N.W.^{1}	N.W.^{3}	–	2 P.M.	1.80	–
14	40	55	45	2 W.^{1}	1 W.^{1}	– –	N.W.^{2}	W.^{1}	do.^{2}	–	–	–	–
15	40	53	49	4 do.^{1}	7 do.^{1}	10 W.^{1}	do.^{2}	N.W.^{1}	S.W.^{1}	–	–	–	–
16	50	51	41	10 do.^{1}	8 do.^{1}	9 N.^{2}	W.^{3}	W.^{3}	N.^{3}	–	–	–	–
17	23	30	25	4 do.^{1}	10 –	10 –	N.^{2}	N.W.^{1}	S.E.^{1}	4½ P.M. sn.	8 P.M.	.60	1½ inch.
18	30	35	27.5	10 –	5 N.W.^{3}	– –	N.E.^{1}	do.^{2}	S.W.^{2}	[and rain.	–	–	–
19	28	32	25	1 –	7 do.^{2}	2 N.W.^{2}	W.^{2}	W.^{2}	N.W.^{2}	–	–	–	–
20	15	25	19	1 –	2 do.^{1}	1 –	N.W.^{1}	do.^{1}	do.^{1}	–	–	–	–
21	23	29	32	10 –	10 –	10 –	E.^{1}	S.E.^{1}	W.^{1}	7 A.M.	7 P.M.	.25	2 inches.
22	21	20	17	3 N.^{3}	1 –	– –	N.^{3}	N.W.^{4}	N.W.^{3}	–	–	–	–
23	14	30	35.5	9 W.^{1}	10 W.^{3}	9 S.W.^{3}	W.^{2}	W.^{4}	S.W.^{4}	–	–	–	–
24	32	21	16	10 N.W.^{3}	– –	– –	N.W.^{3}	N.W.^{3}	N.W.^{1}	–	–	–	–
25	15	33	41	2 do.^{2}	10 S.W.^{2}	10 –	W.^{1}	S.^{2}	S.W.^{2}	in night.	in night.	.22	–
26	41.5	44	35.5	7 W.^{3}	7 W.^{3}	9 N.W.^{3}	do.^{3}	W.^{2}	N.W.^{2}	–	–	–	–
27	26	34.5	34	1 –	8 do.^{2}	1 –	do.^{1}	do.^{2}	S.W.^{3}	–	–	–	–
28	32	43	33	4 S.W.^{1}	6 do.^{1}	4 W.^{1}	S.W.^{2}	do.^{1}	W.^{1}	–	–	–	–
29	25	21	18	10 W.^{1}	1 N.^{2}	8 N.W.^{2}	W.^{2}	N.W.^{4}	N.W.^{3}	–	–	–	–
30	18	32.5	27	– –	– –	3 –	N.W.^{4}	do.^{2}	S.W.^{2}	–	–	–	–
										Total, ...		4.52	3½ inches.

DECEMBER—METEOROLOGICAL OBSERVATIONS—*Continued.*

Day of the Month.	THERMOMETER.			CLOUDS. Extent, course and velocity. 10=quite cov'd. 1=2 miles an hour, 2=4 miles an hour, etc.			WIND. Direction and force. 10 = hurricane.			RAIN AND MELTED SNOW.			
	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Hour began.	Hour ended.	Amount of rain and melted snow in inches & hund'ths.	Amount of snow in inches and hund'ths.
1	27	43	35	1 –	1 –	– –	W.^{2}	S.W.^{2}	W.^{2}	–	–	–	–
2	36.5	43	43	8 S.W.^{3}	10 S.W.^{2}	10 S.W.^{3}	S.W.^{2}	do.^{2}	S.W.^{3}	–	–	–	–
3	34	39	30	9 W.^{2}	6 W.^{2}	1 –	W.^{2}	W.^{2}	W.^{2}	–	–	–	–
4	28	36	28	4 do.^{2}	6 do.^{2}	10 W.^{1}	do.^{2}	do.^{1}	S.W.^{1}	–	–	–	–
5	29	42	32	10 do.^{1}	– –	– –	do.^{1}	do.^{1}	W.^{1}	–	–	–	–
6	33	39	35	10 do.^{1}	6 W.^{1}	10 –	E.^{1}	E.^{1}	S.W.^{1}	–	–	–	–
7	32	37	28	10 do.^{1}	5 do.^{1}	– –	N.W.^{2}	N.W.^{3}	N.W.^{3}	–	–	–	–
8	20	32 5	25	1 –	1 –	– –	do.^{2}	do.^{2}	do.^{1}	–	–	–	–
9	25	38	46	10 E.^{1}	10 S.E.^{2}	10 –	E.^{1}	S.E.^{2}	S.^{3}	5 A.M.	2 P.M.	1.40	1½ inch.
10	33	33	25.5	8 S.W.^{3}	5 S.W.^{3}	7 W.^{2}	S.W.^{3}	S.W.^{3}	W.^{2}	–	–	–	–
11	21	21	18	8 W.^{2}	7 W.^{2}	– –	W.^{2}	W.^{2}	N.^{2}	–	–	–	–
12	10	22	16	– –	1 –	– –	do.^{1}	N.W.^{2}	W.^{1}	–	–	–	–
13	18.5	20	22	10 –	10 –	10 –	E.^{1}	S.E.^{1}	N.W.^{3}	3 A.M.	3 P.M.	.06	¾ inch.
14	20	31	25	– –	4 W.^{2}	4 W.^{1}	N.E.^{1}	W.^{1}	S.W.^{1}	–	–	–	–
15	24	30	33	10 N.E.^{1}	10 N.E.^{1}	10 N.E.^{1}	do.^{1}	N.E.^{2}	N.E.^{2}	in night.	–	–	1 inch.
16	33.5	34	46	10 do.^{1}	10 do.^{1}	10 S.E.^{2}	do.^{1}	do.^{1}	do.^{1}	–	ice & snow.	.85	–
17	32	38	31.7	2 W.^{3}	8 W.^{2}	6 W.^{1}	N.W.^{2}	W.^{2}	W.^{1}	–	–	–	–
18	28	27	20.5	– –	10 do.^{2}	– –	W.^{1}	do.^{1}	do.^{1}	–	–	–	–
19	20.5	29	21	10 W.^{1}	10 do.^{1}	1 –	do.^{1}	do.^{1}	do.^{1}	–	–	–	–
20	8.5	26	20.7	– –	– –	– –	N.W.^{2}	N.W.^{1}	do.^{1}	–	–	–	–
21	20	33	33.5	8 N.E.^{1}	10 W.^{2}	10 S.W.^{2}	N.E.^{1}	W.^{2}	S.W.^{1}	–	–	–	–
22	33.4	37	34 5	9 S.W.^{2}	10 S.W.^{1}	10 –	S.W.^{1}	S.W.^{1}	do.^{1}	5 P.M.	10 P M.	.94	–
23	44	42	33	5 W.^{3}	– –	3 W.^{1}	W.^{3}	W.^{2}	W.^{1}	–	–	–	–
24	35.5	31.5	25	10 do.^{1}	9 W.^{1}	10 –	do.^{1}	N.W.^{2}	N.E.^{2}	–	–	–	–
25	21	16.5	20	10 N E.^{3}	10 N.E.^{2}	10 N.E.^{3}	N E.^{3}	N.E.^{3}	do.^{3}	5 A.M.	8 P.M.	1.11	2 inches.
26	29	16	14	10 W.^{2}	1 N.W.^{4}	3 N.W.^{3}	W.^{2}	N.W.^{4}	N.W.^{3}	–	–	–	–
27	9.5	15	12	– –	1 do.^{2}	4 W.^{1}	N.W.^{2}	do ^{3}	W.^{2}	–	–	–	–
28	14.5	20.5	15	10 W.^{2}	9 W.^{3}	– –	S.W.^{2}	W.^{2}	S.E.	–	–	–	–
29	3.5	12	10.5	2 N.^{1}	10 E.^{1}	10 N.E.^{2}	N.^{1}	E.^{1}	N.E.^{2}	4 P.M.	–	–	–
30	16	21	14	10 N.W.^{1}	5 N.W.^{3}	– –	N.W.^{1}	N.W.^{3}	N.W.^{3}	–	8 A.M.	.47	6 inches.
31	8	20	12	1 W.^{2}	2 S.W.^{1}	– –	W.^{1}	S.W.^{1}	W.^{1}	–	–	–	–
										Total, ...		4.83	11¾ inches.

Amount of snow during the year, 50.25 inches.

Amount of rain and melted snow during the year, 48.35 inches.

Coldest day of the year, 7th of February; the mean of that day was 7.6 degrees below zero.

Warmest day of the year, June 30; the mean of that day was 78.2 degrees above zero.

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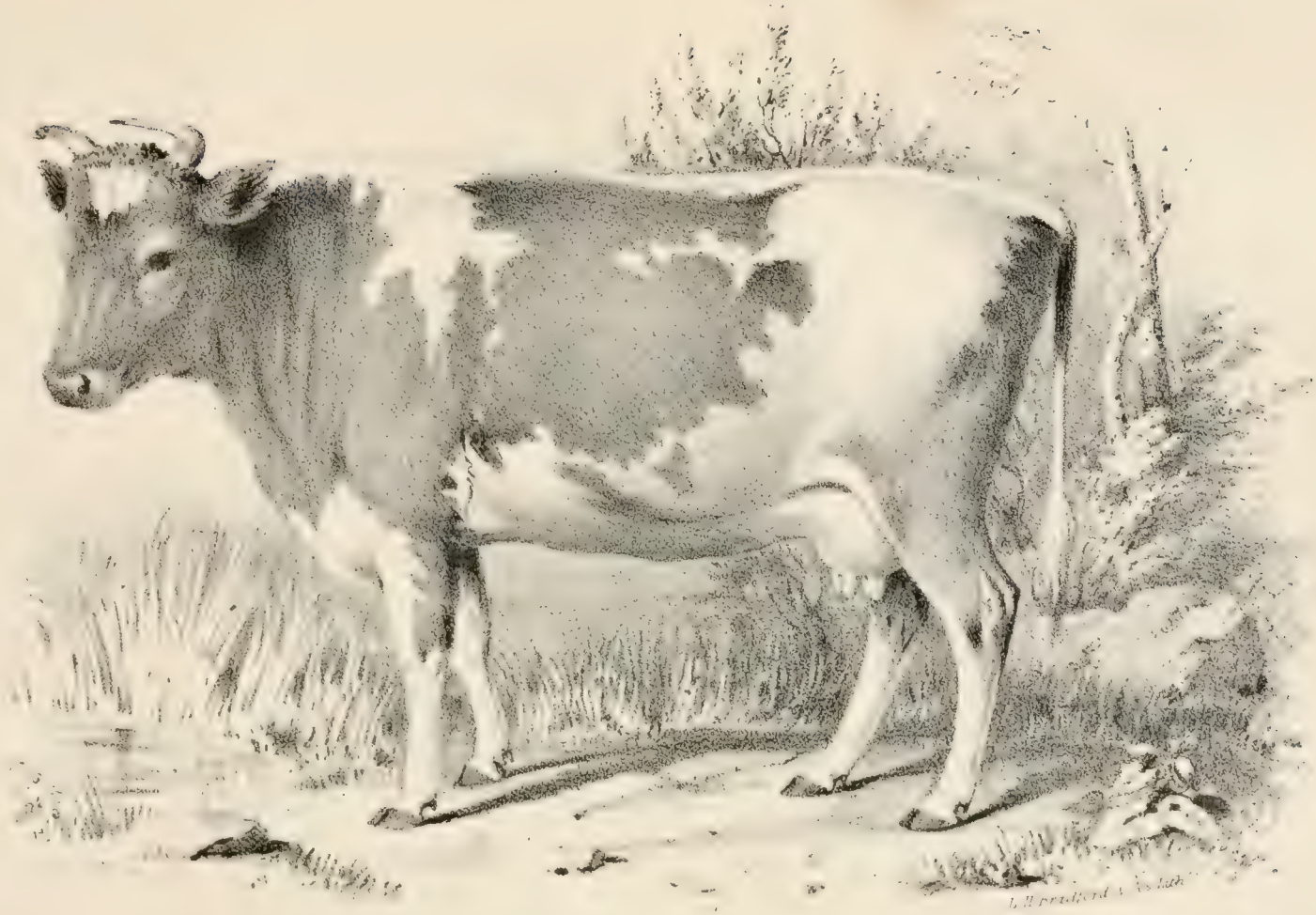

ALICE.

Jersey Cow. Owned by the State.

See Preface to P't 2nd & p. 27 P't 1st

ABSTRACT OF RETURNS

OF THE

AGRICULTURAL SOCIETIES

OF

MASSACHUSETTS,

1855.

EDITED BY

CHARLES L. FLINT,

Secretary of the Board of Agriculture.

BOSTON:

WILLIAM WHITE, PRINTER TO THE STATE.

1856.

PREFACE.

The materials returned by the various societies, for the past year, have been somewhat more than usually condensed. One reason for this was, that a certain class of statements, in some of the reports, was found to be precisely the same, year after year,—stereotyped, as it were,—so that nothing new was added upon the subject-matter to which they relate. As matters of reference, a few, even of such statements, may be valuable; but they can possess no general interest, nor add any thing of permanent value to the present stock of knowledge on those subjects.

The plan adopted at the outset was, to exclude from this volume all matter which was not of some general interest or value. This was evidently the contemplation of the law which required the annual publication of an *abstract* of the returns. A thousand details may be of interest and value in the Transactions of the county, which are of no general interest whatever. It matters little to Mr. A., in Berkshire county, whether Mr. B., in Essex county, receives a gratuity of twenty-five cents, on a show of vegetables, or not. Such details have, therefore, been excluded, as of little interest in a volume intended for general distribution.

Much greater promptness is needed in preparing the Transactions, on the part of the officers of some of the societies. Complete returns were not made till after the first of March of the present year, by several societies required by law to make these returns on or before the 10th of December, 1855. The difficulty of getting the full returns in season for use in this abstract has been found to be such as to require a more rigid construction of the law hereafter.

Far greater care is also needed in the measurement of crops entered for premiums, in several of the societies, where the practice in this respect is surprisingly loose and unsatisfactory. The mere "guess" of a committee or of an individual is not sufficient, where exactness can by any means be obtained. The remarks of Mr. Colman, with reference to the Berkshire Society, nearly twenty years ago, might not inappropriately be applied to several societies even at this day. "As I understood," says he, "the mode of examination adopted by the committees, it was much more matter of judgment than of exact measurement. *In all cases of grain crops, or of other crops which admit of an accurate ascertainment, this should be insisted upon by the Society before bestowing the premium;* and where exactness cannot be reached, it should be approached as nearly as possible. In addition to this, the claimant for the premium should be required to give a full and detailed account of his cultivation, the nature and condition of the soil, the manures used, quantity and kind; the quantity of seed, the kind of seed, its preparation, and time and manner of sowing, the after cultivation of the crop, the mode of harvesting, the use and value of

the crop, the whole expenses, and every important circumstance connected with it."

If the premiums offered by the society are not large enough to pay for care and accuracy of measurement, let them be made larger, or let the time required to arrive at a satisfactory result be paid for, else let the premium be withheld altogether.

This subject demands the earnest and immediate attention of the officers of those societies in which this loose and defective method of measurement exists. While some sections, encouraged by the generous bounty of the State, are laboring with all the earnestness and vigor of youth to add to our practical knowledge of agriculture, accurate facts and statistics, it is wrong and unfair that other sections, receiving an equal portion of this bounty, should indulge the apathy of age, and come short of the mark, for the want of a proper system of measurement.*

The prosperity of the societies has continued to increase, while many of them have added new features of attraction to the usual exhibitions, in the shape of permanent grounds, halls, tracks, &c. The report of the President and Secretary of the Norfolk Society, with reference to this point, says: "The Society, since its last annual exhibition, has added to its grounds, by purchase, eight acres of land, at a cost of $2,500, which has been enclosed by a tight board fence, at a cost of $750.

"This addition was required, to afford room for a course or track in which animals might be displayed and their qualities of beauty and speed tested, in presence of

* See Note on this subject, p. 86.

the numerous spectators who are accustomed to attend the annual exhibition.

"An increased amount of premiums was guaranteed in part by the public spirit and liberality of members of the Society, in order to increase the attraction and add to the interest and usefulness of the Horse department of this Show. The experiment proved to be highly successful, affording an agreeable and wholesome pastime to a large and intelligent concourse of citizens from this and the neighboring counties, including ladies, who were accommodated with seats, elevated and commodious, enabling them to overlook the entire enclosure devoted to the display of horses, without danger, and out of the reach of annoyance from the crowd. The income produced by this addition to the attraction of the Show, will undoubtedly compensate for the additional outlay for the land."

Substantially the same course has been adopted by the Housatonic, the Berkshire, the Worcester and the Plymouth Societies. The report of the Plymouth Society says: "The cost of the lot purchased for the use of the Society was $2,639.11; a little less than one hundred dollars per acre. About one hundred rods of substantial board fence, supported by stone posts, have been erected; the inequalities of the upland have been removed; the little central grove has been thinned and trimmed with good taste; and a riding course has been made whose circuit measures half a mile, upon the inner circumference of which a row of elms has been transplanted by one who is most devoted to the interest of the Society, and who particularly rejoices in view of the majesty and cooling summer shade of our noble forest trees."

The exhibition of this Society was eminently successful, and it has "begun anew" under very favorable auspices.

The want of suitable accommodations is seriously felt by other societies, one of which, the Hampshire, remarks as follows upon this subject: "The present year has been one of prosperity and progress. The funds of the Society have constantly increased, and the interest in its welfare has extended. The annual exhibition was well sustained in all its departments, and exceeded its predecessors in many essential particulars. As it has become, from year to year, more extensive, more attractive and more instructive, the want of a suitable hall has been felt more and more."

The influence of the societies, when their officers are prompt and active, is more and more extensively felt, and the amount of good they can accomplish in various ways is limited only by the interest and activity of their officers.

The arrangement adopted in the present Report is substantially the same as that of the two preceding. A complete index will be found at the end.

The plate which forms the frontispiece of this volume represents the Hereford cow "Milton," owned by the State, and kept at the State Farm, at Westborough. This is, probably, the best animal of this breed in the country. She received the first prize of one hundred dollars at the exhibition of the National Agricultural Society, in Boston, in October, 1855, being at that time just five years old. She was bred in England, and imported by Mr. Dowley, of Vermont, in 1852. The calf by her side, "Cronkill II.," sired by "Cronkill," which

also received a first prize of one hundred dollars at the National Exhibition, at Boston, is now three months old.

The Hereford heifer, "Cora," is one year old, sired by "Cronkill," dam, "Milton," both imported. She is very large of her age, and gives promise of making a superior animal.

The Jersey cow, "Alice," was presented to the State by the Massachusetts Society for the Promotion of Agriculture, to be kept at the State Farm, under the charge of the Board of Agriculture. She is a fine specimen of that breed, having given, in September last, thirty-six and thirty-seven pounds of milk per day, on ordinary feed, after having brought the calf, "Captain," in June preceding. She will be five years old in May next. Her dam was "Countess," imported by Thomas Motley, Jr., Esq., from the Island of Jersey, and represented in the Report of 1853, pp. 271 and 304.

The Jersey bull, "Captain," sired by "Major," (by "Colonel," see Agriculture of Massachusetts, 1853, frontispiece,) will be one year old in June next. His dam was "Alice," grand-dam, "Countess." He bids fair to make a superior animal.

The financial returns of the societies will be found in the Appendix to the Third Annual Report of the Secretary of the Board of Agriculture.

C. L. FLINT.

Boston, March, 1856.

OFFICERS OF AGRICULTURAL SOCIETIES.

1856.

MASSACHUSETTS.

President—JOHN C. GRAY, of Boston.
Secretary—BENJAMIN GUILD, of Boston.

ESSEX.

President—MOSES NEWELL, of West Newbury.
Secretary—ALLEN W. DODGE, of Hamilton.

MIDDLESEX.

President—SAMUEL CHANDLER, of Lexington.
Secretary—SIMON BROWN, of Concord.

MIDDLESEX SOUTH.

President—WILLIAM BUCKMINSTER, of Framingham.
Secretary—C. C. ESTY, of Framingham.

MIDDLESEX NORTH.

President—WILLIAM SPENCER, of Lowell.
Secretary—LEONARD BROWN, of Lowell.

WORCESTER.

President—JOHN BROOKS, of Princeton.
Secretary—WILLIAM S. LINCOLN, of Worcester.

WORCESTER WEST.

President—JOSIAH WHITE, of Petersham.
Secretary—CHARLES BRIMBLECOM, of Barre.

WORCESTER NORTH.

President—THOMAS R. BOUTELLE, of Fitchburg.
Secretary—JABEZ FISHER, of Fitchburg.

WORCESTER SOUTH.

President—OLIVER C. FELTON, of Brookfield.
Secretary—AARON LYON, of Sturbridge.

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President—PAOLI LATHROP, of South Hadley Falls.
Secretary—H. I. HODGES, of Northampton.

HAMPSHIRE.

President—WILLIAM P. DICKINSON, of Hadley.
Secretary—JAMES W. BOYDEN, of Amherst.

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President—HORACE M. SESSIONS, of Wilbraham.
Secretary—A. A. ALLEN, of Springfield.

FRANKLIN.

President—JOSIAH FOGG, of Deerfield.
Secretary—JAMES S. GRENNELL, of Greenfield.

BERKSHIRE.

President—ELEAZUR WILLIAMS, of Richmond.
Secretary—E. H. KELLOGG, of Pittsfield.

HOUSATONIC.

President—JAMES H. ROWLEY, of Egremont.
Secretary—JAMES SEDGWICK, of Great Barrington.

NORFOLK.

President—MARSHALL P. WILDER, of Dorchester.
Secretary—EDWARD L. KEYES, of Dedham.

BRISTOL.

President—NATHAN DURFEE, of Fall River.
Secretary—LEMUEL T. TALBOT, of Taunton.

PLYMOUTH.

President—BENJAMIN HOBART, of Abington.

Secretary—WILLIAMS LATHAM, of Bridgewater.

BARNSTABLE.

President—S. B. PHINNEY, of Barnstable.

Secretary—GEORGE MARSTON, of Barnstable.

EXHIBITIONS OF 1856.

Massachusetts,	at	Worcester,	Sept. 25.
Essex,	"	Newburyport,	Oct. 1 and 2.
Middlesex,	"	Concord,	Sept. 30.
Middlesex North,	"	Chelmsford,	Sept. 17.
Middlesex South,	"	Framingham,	Sept. 17 and 18.
Worcester,	"	Worcester,	Sept. 24 and 26.
Worcester West,	"	Barre,	Sept. 18.
Worcester North,	"	Fitchburg,	Sept. 19.
Worcester South,	"	Sturbridge,	Oct. 1 and 2.
Hampshire, Franklin and Hampden,	"	Northampton,	Oct. 7 and 8.
Hampshire,	"	Amherst,	Oct. 9 and 10.
Hampden,	"	Springfield,	Oct. 1, 2 and 3.
Franklin,	"	Greenfield,	Oct. 1 and 2.
Berkshire,	"	Pittsfield,	Oct. 1, 2 and 3.
Housatonic,	"	Great Barrington,	Sept. 24 and 25.
Norfolk,	"	Dedham,	Sept. 30, and Oct. 1.
Bristol,	"	Fall River,	Oct. 1 and 2.
Plymouth,	"	Bridgewater,	Sept. 24 and 25.
Barnstable,	"	Barnstable,	Oct. 7 and 8.

AGRICULTURE OF MASSACHUSETTS.

The aggregate amount awarded for farm management throughout the State during the past year, was but thirty-seven dollars! This does not, of course, include the amount offered for specific objects, like the reclaiming of swamps, pastures, &c.; but it shows how reluctant the farmer is to subject his entire management to the judgment of a committee.

This is owing in part, probably, to causes quite sufficient in themselves to account for it, however much their existence may be regretted. This subject has already attracted notice, and it is thus alluded to in the report of the chairman of the committee of the Essex Society, on

FARMS.

The fact seems at length to be established, that the long-tried system of offering premiums for farm management, is, unfortunately, a bad one. That mistakes have sometimes been made in awarding premiums, is not improbable; but this will by no means account for the singular fact, that, notwithstanding the offer of premiums really worth any man's having, not a farmer in the county now cares enough about them to apply for them. The Committee on Farms for 1852, in their report drawn up by our indefatigable Secretary, speak of "reiterating the old complaint that so few of our farmers have been willing to come forward as competitors for the liberal premiums offered for farm management." In that year there was *one* claimant, but it was the last one. The same premiums have continually been offered, but no claimant appears. If this state of things

were confined to Essex County, we should be ready to infer that the fault might not be so much in the system as in the unfortunate administration of it. But this supposition is precluded by the fact, that the history of other societies is nearly the same. Thus of the *sixteen* agricultural societies in the State in 1854, only *five* found a single claimant for farm management. It is true, certain specific improvements on many farms in our county were made, as reported in that year, for which the trustees awarded premiums and gratuities to the amount of three hundred and twenty-six dollars; but while the society still looks with favor upon efforts to reclaim meadows, pasture land, &c., the grand idea is to induce every farmer to improve and manage his *whole* farm better from year to year. We have had the showy productions exhibited, and have been gratified; but has this been a fair exponent of the whole, and especially of the part left at home? A beautiful heifer is taken from the drove and prepared for exhibition; but is she a good representative of the cows left behind? Our committees are delighted with the forest trees and the orchards upon a given farm, but what was the condition of the farm itself?

Now, it is true, the farmer must begin a system of improvements somewhere, if he begins at all; he must take one thing at a time; but will he stop there long? Does not one pleasant spot raise the desire for another and another? If not, there is something wrong. And may it not too often be the case, particularly with regard to animals, that the petted creature taken to the show, is the result of accident and not of training? It was the remark of a judicious farmer not many years since, one who had paid much attention to the improvement of his stock, yet who never exhibited a single animal, that if farmers would drive their *whole* stock of cattle to the show, then he would drive his. His idea was, that no improvements which failed of reaching *all* the farmer had, were worthy the name of improvements. And so, whatever may have been done on the meadow, the pasture, or the forest, if the great body of the farm is proportionably neglected, the real gain must have been small. These remarks are intended to throw additional light upon the subject of the better management of the farm—the whole farm, large or small. How shall the society effect an object so noble as this? Money will not do it. If thirty

dollars—the highest premium—will not produce this effect, probably three hundred would not. Perhaps it is the mortification of a possible failure that so terrifies some. And it is easily perceived that one man, in the prospect of a glittering premium, might spend all his income, and a great deal more, in improving his farm, while another has no "great deal more" to lay out, and must live out of what he has, if he live at all. Who gets most income from least expense, is the true question. But the farmer of ample means in pursuit of a dazzling premium is cut off in his own judgment by such a principle in making awards, while the one of limited means, from the very nature of his circumstances, is precluded from making many of those important improvements which the society wishes to encourage.

The foregoing considerations may aid the society in determining the question, whether the money now offered for farm management may not be either appropriated to some other use, or a portion of it expended in visiting farms under superior management, but whose owners, for some reasons, do not ask for the premiums which are now offered by the society.

But to argue the subject a little closer, it may be said that if the grand object of the Agricultural Society is to improve the farms in the county of Essex, and premiums both great and small fail of doing it, then an appeal to a certain principle of human nature may at least be tried. The State Board of Education appealed to it, and that principle responded. When the first Secretary of the Board began his mission among the school districts of the State, and fixed his inquisitorial eye upon the school-houses, the public could not bear his gaze; and in five short years from the time when the Board of Education made their report to the legislature, on the condition of the school-houses, the sums expended for new houses and repairs upon old ones, fell but little short of $700,000; and for several of the years next succeeding, the sum expended upon school-houses was $150,000 annually. Now what was the secret of all this change? Simply that the school-houses of that day could not bear a close inspection. And to apply the moral to the case in hand: let it be once understood that a committee of this society propose to visit a certain number of farms in a year till all in the county have received a call, unless the owners should posi-

tively refuse to receive them, and is it difficult to conceive of the effects that would naturally follow? If it is natural for our wives and daughters to scrub, and scour, and clean, and sweep, in anticipation of the call of friends and visitors, would it not be as natural for farmers and farmers' sons to dress and keep the farm which was to be the object of inspection at a day and hour which they could not know long beforehand? Is there a man in the county on whose farm the note of preparation would not be heard at once? Would not compost heaps and stone walls be the order of the day? And what chance would there be for wormwood, and burdocks, and thistles to stand as they often do, in the very Goshen of the farm?

The undersigned being alone responsible for the Report, would earnestly ask the trustees to consider the measure here proposed, and to act in the premises according to their maturest convictions.

The farm of William R. Putnam was visited by a majority of the committee on the 29th of August. It is beautifully situated in Danvers, near to Swan's crossing, so called, upon the Essex Railroad. It consists of seventy acres of as fine land as can be found in the county; the crops all show it, and the style of cultivating and managing pay the highest compliment to the owner.

A fine orchard of seventy trees, well fruited for this year, to say nothing of the many trees scattered over the farm, attracted the favorable attention of the committee, from the mode in which the trees were planted. The rows were fifty feet apart by twenty-eight—a portion of them being set out in 1846, and the remainder three years later. A good crop of hay was taken from between the rows, while the rows themselves were kept ploughed, though not manured, since setting out. The leaves of the Aunt Hannah apple were rusted, as were those of the Bartlett pear, while all others, so far as now recollected, were vigorous. The same fact seems to have been noticed elsewhere, as was remarked by several gentlemen present. Who can account for it, or for *rust any where* at *any time?*

Mr. Putnam took the committee into a field lying north of the road, where a fine crop of millet was growing, quite an object of curiosity to some of the committee, being rather an unusual crop. It was sown on the 28th of June, immediately

after removing the English hay, and was now nearly fit for fodder, and would probably be fit for seed in a week more. Mr. P. had sown three quarts of seed upon about forty rods, and the crop was luxuriant.

A field of white beans, nearly ripe, was shown us, where a crop of rareripe onions had been grown this year, and sold at market. Both the crops upon his land have grown and ripened in less time than the pea bean alone would have required, although the latter may be preferred by some for table use.

The field containing the above mentioned crops of millet and beans, has also near the middle of it, an object of curiosity in the well of water dug and used by Gen. Putnam, before mentioned. It is apparently rather a hinderance to farming operations, but its historical interest preserves it, and it is to be hoped it always will.

Mr. P. manures his potatoes in the hill; the Chenangoes and Kidneys, at the time of our visit, showed some signs of disease, while the hardy black potato was resisting it bravely as usual. The rot, however, has this year been arrested by some agent as mysterious in its operation as was that which produced the rot itself; and that invaluable esculent is abundant, and of unusually large size, although almost every where else, if not here, the seed planted has this year been of small size; a fact of disagreeable import to most speculating writers upon this subject.

Mr. Putnam manures his carrot land with muscle bed mud, at the rate of six cords to the acre. For onions he uses both ashes and barn-yard manure. Mr. P. does not raise all his corn in one field, but in different lots, and on soils somewhat different. One object gained by this arrangement is, that he can try different varieties, as he avers, some three or four, without intermixture; also, the effect of different manures may in this way be contrasted. A piece of one-half an acre was shown, manured with one-fourth night soil and three-fourths meadow mud, looking finely.

Mr. Putnam had reclaimed five acres of meadow, but the railroad cutting through it has produced peculiar effects, injuring the hay crops, though improving some others. Apple trees upon the reclaimed meadow grow luxuriantly.

The dairy upon this farm is managed differently from that in towns remote from market. Mr. P. keeps nine cows. They

are milked at four o'clock in the morning through the summer, and at twelve o'clock at noon, at which time they are fed with corn fodder. The milk is taken from his place immediately after milking, by the buyer, who carries it to market.

The committee are aware that a feeling of dissatisfaction may arise on account of the imperfection of this statement in one respect, viz.: the *results* of Mr. Putnam's farming. This, however, as remarked last year by the chairman, in a letter published in the Society's Transactions, is unavoidable, because a large part of the crops were still growing. There was one attempt made to obtain the opinion of the committee, relating to the amount of Indian corn upon an acre. No one put it at less than *seventy-five* bushels when shelled, nor more than *eighty*. It was a noble crop. But clean culture, a long war with weeds every where over the whole farm, was most manifest.

From the farm and hospitable mansion of Mr. Putnam, the committee, with other gentlemen in attendance, proceeded, on invitation, to the place of A. G. Bradstreet. Mr. B. has four acres only, but it paid well for the time. The lot is chiefly or wholly in orcharding. One fact affords a key to the whole, showing the most careful and judicious selection. There was room for 400 peach trees in the orchard, but 1,600 had to be sifted in order to find them. The planting out was no doubt as easily done, the subsequent washing in soft soap and sand, frequent stirring of the entire surface of the field, all go to account for the fact, that each tree produced three dollars worth of peaches in three years from the bud. Even in this almost peachless year, the trees were well fruited, many of them very well. The early York peach tree, says Mr. B., winter-kills more than any other. Mr. B. has eighty apple trees all planted twenty-eight feet apart, with a peach tree between every two. The peach trees yielded two hundred and fifty dollars worth of fruit for the market two years ago. Seventy-five pear trees are growing and thriving upon the same four acres.

With a horse, one cow, and two pigs, well supplied with meadow mud, Mr. Bradstreet makes ten cords of manure annually. The chairman regrets that on account of the short time devoted to this farm, so few facts were collected for the benefit of the public. And the same remark may be made with regard to the farm of Francis Dodge, situated near the two

above described. It is a farm of one hundred and fifteen acres, and situated upon the summit and sides of a beautiful swell, overlooking Salem harbor and the bay, with a large part of Essex County, and in sight of Wachusett if not Monadnoc mountains. The orcharding is splendid—from 500 to 600 trees, and mostly well fruited. This is a milk farm to a great extent, having twenty-three cows. The other stock consists of six oxen, three horses, and one bull. Mr. Dodge has owned and occupied this farm since 1840, although, singularly enough, it has changed owners five times within twenty years. It stands the present owner at $7,500, and apparently needs but few repairs. The stone walls are a sight worth many miles of travel to see. They stand six feet high in the clear. . They are founded, too, upon rocks, being ditch-wall, and are built of stone so massive and with such finish, that a man may go with a loaded wheelbarrow upon the top, round entire fields.

Mr. Dodge has half an acre in squashes, which attracted much attention on account of the crop which was, like many others this year, more than large. We speak of it to say that it was manured with one part night soil to three of meadow mud. On inquiring for Mr. D.'s method of treating the yellow squash bug, he informed us he does not kill or suffer the bug to be killed; not, however, out of any special regard to the insect, but because in killing, you almost always injure the vine itself,—that is, the tender and vital part of it,—by pinching. That same tender part, however, will bear the application of quicklime, which is more than the yellow bug can bear. There could not have been less than seven tons of squashes, it was thought by some present, upon the half acre.

Mr. D. has about four acres in corn, and the committee, or some of them, judged that the yield would be about eighty bushels of shelled corn to the acre. No guano or other concentrated manure has been used, but some ashes; the quantity could not be ascertained in the hurry of the day.

Mr. Dodge has about one-fourth of an acre in ruta bagas of sterling growth; one-third of an acre in cucumbers, and one and a half acre in corn fodder. This noble farm has forty acres of ploughed land, and is subjected, like the two before described farms, to the *cleanest culture*. Mr. Dodge keeps

three hired men and a boy through the season. The marketing is done by himself.

The visit of the committee to Indian Hill Farm, in West Newbury, gave them the greatest pleasure. I am happy here to introduce an interesting letter from Dr. Loring, of Salem, who favored the committee with his company on their visit to this celebrated farm, so full and explicit as to make any alteration entirely unnecessary.

Salem, October, 22, 1855.

Dear Sir:—I trust my long delay has not induced you to suppose that I have forgotten the very agreeable and interesting day we spent at Indian Hill Farm, in September, or that I had relinquished all idea of fulfilling the promise made you at that time, to lay before you a record of our observations. I should have been more prompt, had I not labored under the necessity of obtaining certain important facts, which have reached me only this very morning.

I think you will agree with me that Indian Hill Farm is one of the most beautifully located spots in Essex County; and that, in addition to its charming landscapes, it possesses a variety of soil and agricultural resource rarely met with in the same extent of territory. It has an additional interest, too, in the fact, that Major Poore, the present proprietor, occupies the acres of his fathers, possessed by them from the earliest settlement of the country, and made rich by time in the traditions of his family. Few estates in this country have more objects of interest. The house, built as we were told, according to the architecture of the ancestral mansion in England, carries you back to the days of the lordly halls of barons, when tower and turret had an important and serious signification. The curiosities which have been collected by Major Poore tell of a busy and stormy world, whose murmur alone can reach that quiet spot. The elm tree in front of the door, planted by Rufus King in the early days of his patriotic service, brings before you a crowd of interesting scenes, from times whose every event was replete with the deepest interest. The whole place, with its relics of the Province House, its antique printing-press, its armor from Malta, its sword of the revolution, its horse-shoes

from Arabia, its bits from Mexico, its collection of autographs gathered from the most valuable sources, its rich agricultural library, forms an object of attraction to the scholar, the man of taste, and the farmer.

Of the practical operations on the farm, I can furnish you an account received mainly from Major Poore himself. He declines giving any statement of his crops, on the ground that he is but serving a practical apprenticeship in agriculture. It is two years since he commenced taking charge of the farm, with a determination not to engage blindly in "fancy farming," but to experiment cautiously upon the most profitable manner of keeping land in a high state of cultivation. In showing the farm to the committee, you will remember, he disclaimed all credit for himself, as the improvements were projected and generally carried on by his father, Benjamin Poore, Esq., one of the early members of our society. Although engaged in mercantile pursuits, which allowed him to pass but a few months of each year at Indian Hill, Mr. Poore was enthusiastically devoted to the care of his homestead. A record of his labors is contained in a detailed journal, kept under his direction, of all the work done on the farm from 1818, to his departure for California in 1850. This journal, which is continued by the present proprietor, embraces a vast amount of practical agricultural information, and illustrates the value of system on a farm. In its account of ditching, blasting rocks, deep ploughing and building, with the importation of cattle and seeds, we can trace the gradual improvement of what, in 1818, was an ordinary tract of land, with a fence around a swampy portion of it to prevent the cattle from getting mired. At first, these improvements were looked upon with prejudice, and in 1828, a committee of the Essex County Agricultural Society simply alluded to it last among the six farms entered. The underdraining, and the rotation of crops, introduced by a Scotch manager, met with no favor. "While it remains uncertain," says the report, "whether the innovations that have been introduced upon *Yankee husbandry*, are not experiments made for display, unmindful of the cost, rather than experiments that will remunerate themselves, your committee feel it to be their duty to hesitate in approving of the same."

Mr. Poore, as his farm journals show, was not discouraged,

but continued the same system, and entered the farm again in 1844, when the Massachusetts Society for Promoting Agriculture offered premiums for the best cultivated farms. Eleven farms were at that time entered, and the first premium of two hundred dollars was awarded to Indian Hill Farm, with an additional gratuity of fifty dollars for experiments in draining. Long articles from Isaac Hill, John S. Skinner, Henry Colman, and Joseph Breck, in the agricultural journals of the day, endorse the high terms of praise awarded to Mr. Poore, by Mr. Phinney, in his report, as the farm "long noted for its durable and well contrived structures, and for the systematic culture of its grounds." The swamp of 1818 was then thoroughly drained, and produced a heavy burthen of English hay—a remunerative experiment.

Indian Hill Farm contains one hundred and twenty-one and three-fourths acres, with over two hundred acres of out-land pasture, woodland, and salt marsh. The entire homestead is under cultivation, with the exception of eight acres, on the steep sides of the hill, covered with thrifty young forest trees. This thriving plantation which received a gratuity of thirty dollars from the Essex Society in 1843, now contains upwards of four thousand trees—black and red oak, walnut, scotch fir, and locust. The locusts were planted to furnish shade, and they now keep the farm well supplied with posts and small wood. Care is taken to keep the oaks and walnuts well thinned out, and cattle are carefully excluded. It is thought that the locust posts make this plantation remunerative at the present time, while the thousands of young fir trees springing up from the seed in the rich forest mould, will add to their present profits, and the steady growth of the oaks and walnuts promises an abundant supply of timber at no very distant date.

In addition to these plantations I noticed a beautiful avenue of chestnuts, a curious specimen of ground ash engrafted upon the mountain ash, and some valuable fruit trees.

The soil of the farm appears to be, on the highlands, a yellow gravelly loam resting on a clay pan—the meadows, alluvial deposit also resting on clay. The land for the last thirty years has always been ploughed deep, and cultivated in ridges, excepting when planted with Indian corn, in which case the ground is left flat. On the upland, a rotation of potatoes, corn

and oats, is used to renovate grass land; in the meadows, winter rye and grass seed are sown, after taking off the crop of hay, which is the chief "sale crop."

The buildings on the farm are very substantial and convenient. The barn is one hundred and twenty feet in length by forty-two in width, with two wings, each eighty feet in length, one of which is connected with the house. It has a basement story of stone, containing the stables, root-cellar, hennery, cider mill, and hay press. The horses and cattle stand on stone pavements, with stone gutters leading to a large manure tank, into which loam is frequently thrown during the summer. The hay is stored in the second story of the barn, on either side of a floor two hundred feet in length, upon which ten or twelve loads of hay can stand at once to be unloaded. One wing of the barn contains a carriage house, cart shed, and carpenter's shop, where all the ordinary repairing of the farm is done. The barn-yard is so arranged that the drainage is carried into the tank above mentioned. The stock on the farm generally consists of four oxen, seven cows, and four young cattle, mostly Durhams crossed with the Ayrshire, which cross has been found to be most profitable for the farm.

I regret that I have been unable to give a more explicit account of the management and products of this interesting farm. The convenience of its arrangements, the character of its soil, the variety of its resources, all the fruits of patient and methodical labor in time past, render it a theatre for the most successful agricultural experiments. As a specimen of the system of husbandry (the Scotch) which has been applied to it, it is hardly surpassed—the fundamental work having been accomplished, we doubt not the present proprietor will reap the reward. Here, if any where, the profits of New England agriculture may be put to the test. And I doubt not the account of Major Poore's labors will be as interesting as that of his father's, when his residence on the farm shall have been long enough to furnish the opportunity.

I am truly your obedient friend and servant,

GEO. B. LORING.

HON. DAVID CHOATE, *Chairman of Essex Com. on Farms.*

The chairman of the committee having reason to believe that Ira Worcester, of Ipswich, had for a series of years been successful in Agricultural pursuits, called on him October 5, requesting opportunity to become acquainted with his mode of farm management. Mr. W., it must be premised, is the accomplished master of the House of Correction, Jail and Lunatic Asylum. His own farm, in distinction from the county farm, consists of twenty-three acres of land lying in the south parish. The principal products of his farm in 1854, were twenty-four tons of English hay, for which he received twenty dollars per ton, and four hundred bushels of potatoes—three hundred and fifteen of which he sold for one dollar per bushel.

Mr. W.'s farm of twenty-three acres cost him $4,600, and for the last four years it has paid seven per cent. on the outlay, annually; and in 1853 it paid seven and a half per cent.

Mr. W. keeps six cows, two heifers, three swine, one horse, two colts. With this stock, supplied as they are with the necessary materials, he made last year seventy-eight loads of manure, or thirty-nine and a half cords. And it may be well to say, as many suppose meadow mud to be the indispensable basis of manure, that Mr. W. has no material of this kind at command. He buys spoilt hay for his colts to stand upon, and once in two or three weeks this is thrown out and packed up with other manure from the linto, and other hay, mulch and rock weed put in. The solid part is river mud, making probably one-third of the whole mass. The urine of the cow linto is all made to run into the hog yard, which is also kept well supplied with material for manure.

Mr. W.'s method is to keep but little land up, but to manure well, and keep it up two or three years. He has now six and a half acres in tillage, planted with corn and potatoes. He has five hundred bushels of potatoes in the cellar, and one hundred and fifty to dig. The potatoes were large, as potatoes are every where this year. He planted small ones altogether,—another fact subversive of the theory that none but large ones should be used for seed. Out of two hundred and ninety bushels in one bin now in his cellar, of the finest potatoes for size, he took out only four barrels of small ones! Mr. W. always spreads his manure for potatoes. In 1853 he raised two hundred and fifty-seven bushels of the Bradstreet potato, and had no disease among them.

Mr. W. limits himself to eight bushels of seed potatoes to the acre. It is not to be understood that he prefers the small potato for seed; he usually takes those of medium size, but never the large ones. He declares, however, in the most decided manner, that he has obtained as fine potatoes from the small ones as from any.

The average number of inmates in the Asylum and House of Correction in 1854, was two hundred and eleven.

The sewage of the buildings flows as it should, into a common reservoir; but there, unfortunately, as it should not, it receives the salt water of the river through the fissures of the rocky bed of the reservoir. It is obvious, too, that if the river water can come in, the sewage can *leak out*, even though the mass appears about as wet as it ought to be, yet there must have been an exchange of the most valuable materials from the sewer, for the sea-salt water of the river. Sewage, when unmixed, is more powerful, usually, than the purest guano, and not a particle should be allowed to escape. It is presumed that the bottom will be cemented, or a new locality found, before many years. Should not the county authorities provide for the evil at once?

Farm of Ephraim Brown, situated upon Marblehead Neck, so called, in Marblehead.

It need not be said that the productiveness of this farm has been a frequent topic of remark for some years. To those whose manures have been found somewhere in that long list enumerated by Mr. Richardson in 1854, where "forest leaves, chips, shavings, earth from the poultry yard, pigeon house and ash bins, scraps of leather, and coal ashes," were but small specimens, the crops of Mr. Brown have indeed been incredible. While Mr. B. has not neglected his barn-cellar and barn-yard, —for they both show that they have had the most careful attention,—yet so happily is his farm located, and so wide awake is Mr. B. to the value of sea manure, that all the wealth of his land may be referred to that one word of Mr. Richardson, "*precious kelp.*"

Not one in a thousand of our farmers is situated by the seaside. And as an apology for those who doubt the statements of the great productiveness of Mr. B.'s farm, not one in a thou-

sand has ever stood on the leeward side of a heap of kelp three or four days after it has been brought together. No farmer acquainted with the subject of manures can witness the rapid decay and consequent odor of this article, without conviction that the published results of Marblehead farms are possible. This, then, will be presumed to be conceded. And when the due amount of skill in applying the manures, and adapting the crops to both soils and manures is brought into requisition, then, in the words of Thomson, "laborious man has done his part," and the soil will not be ungrateful.

Mr. Brown has some thirty-five acres of land under the hoe and plough. His help is Irish, altogether. He has ten or twelve men through the summer, though now (19th October) only nine. Mr. B. keeps a blacksmith to do the work of the farm, an arrangement almost indispensable, as his place is a mile and a half from the town. Mr. B. boards his men, and pays from ninety to one hundred and thirty dollars per year for labor; no one but the blacksmith receiving more. Before his present arrangement of the blacksmith's shop upon the farm, the blacksmith's bill amounted to about one hundred and fifty dollars per year. Sixteen cows are generally kept upon the farm, though at this time but twelve. No butter is made on the farm, or cheese, milk being more profitable than either.

As Mr. Brown makes neither butter nor cheese, so he raises no Indian corn. This arrangement affords a great amount of time to devote to other crops, and among these, onions take the lead. It may as well be said once for all, that, as before stated, no man this year offers his farm for premium, and as Mr. B. in particular, offers nothing whatever for premium, so perfect accuracy is not expected, either in regard to the measure of land or the weight and measure of the crops. Statements will therefore be made with such accuracy only as the visitor's own judgment, aided by the owner's knowledge, will afford.

Mr. Brown had eight acres of land in onions; the largest lot containing about three and a half acres. This lot is in the under-drained field noticed in the Transactions of the Society for 1854. A portion of this lot, that part which before underdraining, was covered with stagnant water much of the year, say from one-fourth to one-half an acre, has now upon it the greatest yield of onions, beyond all controversy, ever raised in the

county of Essex. Mr. B.'s estimate, I believe, was 1,000 bushels to the acre for this spot. I cannot estimate it at less than that, and indeed find I had marked on my memorandum as high as 1,200 to the acre, for the spot referred to; and in my present estimate of 1,000 bushels I am fully sustained by several gentlemen, trustees of the society, who visited and examined this field just before the onions were pulled. They were then lying upon the ground, and perhaps seen to better advantage. This amazing yield, it is true, is confined to a comparatively small spot; but if the whole eight acres shall be found to have less than 5,000 bushels of marketable onions, I shall be disappointed. The average would be 625 bushels, and as that amount has not unfrequently been reached in the county, I cannot believe it too high. The manure was chiefly the decomposed kelp before mentioned, ploughed in, with a small quantity of compost manure. Mr. B.'s usual quantity of kelp is eight or ten cords to the acre, but in 1854 he put on twelve cords per acre, and undoubtedly that extra amount is felt in this year's crop, although some fields have suffered by the drought.

A lesson is to be learned from the fact, that upon one side of the under-drained field, for perhaps thirty rods, the last year's crop was *turnips*, and there the onion top is yet somewhat green; but where the onion follows a *carrot crop*, it is nearly as ripe as when following onions themselves. The onion rows in this, and all the other lots, are fourteen inches apart.

Other fields in onions presented crops every way equal to the one above described, with the exeption of the quarter or half acre particularly described. One of these fields, now partly in grass, was taken out the pasture in 1836.

Guano, it may be said in passing, has proved useless upon Mr. B.'s annual crops of all kinds, though two hundred pounds per acre, he thinks, has given an extra ton of hay.

Mr. Brown has five acres in squashes. One measured acre has this year produced ten wagon loads, of one ton each. The squashes are now all stored in lofts well ventilated, lying two deep, and they afford a sight worth any man's ride of a dozen miles to Marblehead to see. Of the five acres in squashes, two acres are of the pure Marrow. These weighed thirteen tons, and they are a splendid exhibition of this delicious vegetable. Of another squash, however, resembling the

Marrow, but regarded by Mr. Brown as inferior to it, being a mixture of the Marrow and India squash, he has produced thirteen and a half tons from one acre! It can be afforded for two-thirds, or perhaps half the price of the Marrow. On inquiry, it appears that the destructive yellow bug, so dreaded every where, and which is usually destroyed by killing, troubles Mr. B. but little. He uses lime. A cask or more is slacked in the usual way, only as dry as possible, and while hot is sown broadcast, in a favorable wind, over the vines. The bugs fly before it, and escape *into the sea*, or somewhere else; at any rate, they never trouble them again, when this is once thoroughly done.

The prospect for a price is probably as good this year as last. One acre of Mr. B.'s squashes then produced thirteen and a half tons; of these, three tons were sold at thirty-five dollars per ton, and the remaining ten and a half tons, at forty dollars per ton.

That some of the farmers of the county of Essex should be able to procure crops and receive remuneration like this, is encouraging. Mr. Brown declares that his crops do not exceed those of his neighbors, whose farms I did not see; and yet he states that he sold $7,000 worth of produce last year, and thinks he shall this year sell $10,000 worth—the whole expense of raising them not exceeding $3,000. If any doubt it, let them look at the crops, for that is the end of all argument. I have said nothing of the two acres of carrots, with thirty tons to the acre. I have said nothing of the two hundred bushels of cranberries, worth at least four dollars per bushel, nor of the English hay, a great article this year, but of which I neglected to take any account. Neither have I referred to the potato crop, a good part of which is the before untried Bermuda Island potato. When all this is reckoned, with the other more minor productions, and when it is recollected that Mr. B.'s whole farm consists of two hundred and forty acres, with, if I recollect, over a mile of beach, supplying a surplus of manure, it will be conceded that Mr. Brown is a model farmer for our county, and that his resources will enable him, probably, to exceed even his present attainments.

DAVID CHOATE, *Chairman.*

WORCESTER WEST.

From the Report of the Committee.

The society, as a condition of its premiums, requires that statements should be made of the receipts and expenditures of the farm during the year. This, to no small part of our farmers, appears a very formidable matter. Unfortunately but few of them are sufficiently careful and accurate in their accounts, if, indeed, they keep any, to make such statements as ought to be satisfactory to a committee.

This is to be regretted; yet your committee cannot recommend any departure from the conditions prescribed. All farmers should keep accounts, should know the actual disbursements and receipts of their business; and if the premiums offered by this society shall have any influence towards such a result, the conditions should certainly, on that account, if no other, be continued.

Another, and perhaps the principal cause may be, that many farmers operate on so limited a scale as to deem their farms not entitled to the notice of the society. This should be regarded as an erroneous opinion, to be at once corrected. Good farms do not depend upon their size, but their excellence; not upon the aggregate amount of crops, but upon the proportionate profit derived from the land, compared with the expense of its culture. That this is the true principle of merit, it is presumed none will dispute; and if so, then no man, however small the number of his acres, ought to regard himself as debarred from entering his farm for premium, and receiving the attention of the committee. Were this view of the subject generally entertained, it is believed that the competition for the society's premiums would be sufficiently active. There are half a dozen small farms, perhaps, to one large one, and many of these farms are cultivated almost wholly by the labor of the owner. Such farms are often, on many accounts, the most interesting farms we have, are conducted with a degree of care, economy and thrift, quite remarkable, and the committee believe that if this description of farms could be fairly presented in the reports of the society, they would be found both interesting and profitable, and go far to make us feel that the true

question is, Who has accomplished most in rearing stock, improving his lands and buildings, and supporting a family, according to the means he has had to do with?

Another cause may be that farmers neglect all thoughts of entering their farms, until the season is so far passed, and so much of their business has been done without note or observation, that they find it too late to prepare to apply to the committee.

Other causes may exist which do not suggest themselves to your committee at this time; but the foregoing are sufficient, if valid, to account for the apparent apathy manifested in regard to the premiums offered for the particular object of which we speak.

Your committee, in view of what has been stated, respectfully recommend, that the offer of premiums for the best cultivated and most productive farms, with such modifications as may seem desirable, be continued, and that measures be taken to diffuse as widely as possible, amongst the members, a knowledge of these premiums; and also, that all farms, of whatever size, are entitled to notice and reward, if found sufficiently meritorious.

AMASA WALKER, *Chairman.*

WORCESTER NORTH.

From the Report of the Committee.

We found the farm of Mr. Abel F. Adams, of Fitchburg, duly entered on the Secretary's book for our inspection. Accordingly the committee, on the 5th of September, paid their respects to him. We spent the forenoon in viewing his orchard and buildings, and the improvements contiguous to them. With all these we were much pleased, finding them arranged in the most convenient manner to facilitate the operations for which they were intended, combining utility with strict economy. His facilities for making manure were found to be such as to suffer nothing to be lost. One barn, ninety by thirty-six feet, and one fifty by thirty feet, with cellars under the whole, with suitable out-buildings, were found to contain keeping and stabling for some fifty head of cattle and horses,

so arranged as to insure them the utmost comfort and care, together with cleanliness. The house we found fitted and furnished in the modern style of beauty, elegance and comfort, which ought to satisfy any man who knows how to prize and enjoy them, and which, we were satisfied from unmistakable evidence, was managed by a presiding spirit, fully competent to the task, whose viands were dispensed with a liberal hand. These buildings, save the small barn, have all been built, with all their appurtenances, by Mr. Adams. His land, mostly extending north from the house, consists of one hundred acres, making his farm extend a long distance from his buildings, consequently greatly increasing the expense of his field operations. Deducting sixteen acres of woodland and two of unimproved pasture, it has all been thoroughly subdued by the plough and divided into suitable and convenient lots by heavy stone wall, including, in the whole, one thousand and fifty rods, making an average of forty-two rods yearly, for twenty-five years, besides carting, by his estimation, stone enough for five hundred more, during the same time. These fields we found throughout, smooth and handsome, though some were very uneven, from being upon a side hill, and most of them supplied with water in troughs. By this judicious arrangement he is enabled to use them alternately, for tillage, mowing, and pasturing, as his convenience or interest may require. In making all these improvements and alterations in the land, by levelling rough and unsightly, as well as unproductive places, and filling deep, inconvenient hollows, almost countless loads of dirt must have been used; yet no scar or hole was visible from whence it came, except where he had built a bank wall from five to seven feet high for some forty rods, in order to make a road to his upper fields. All the rest were covered by walls, or otherwise made smooth and even. In doing all that he has done to bring his farm into such a state of perfect cultivation, he has only made use of the resources of his farm, and made the best of all the advantages within his reach. This is what constitutes a farmer in the most approved acceptation of the term, and for this, as well as for the neat and systematic manner in which he manages his business, your committee call him a pattern worthy of imitation, and most cheerfully award him the premium offered by the society. It will be needless for me to give a

detailed account of the manner of cultivation, as his statement, which he has handed the committee, will do much better. It is evident he has cultivated his land, less with an eye to great crops from all portions, than to extended and permanent improvements. But while his outlays have been large, his income has, some of the time, certainly been handsome. The sale of his milk and calves in 1848 amounted to twelve hundred and fifty-four dollars. One thing more I must mention which is worthy of imitation, and that is his account with himself, by which he is enabled to tell the amount, by estimation, measure, and weight of the products of his farm, together with his bill for labor during the time he has been in the business. During twenty-five years he has paid about ten thousand dollars for labor, and until within a year or two has paid interest money besides. Were more to adopt this plan, that without a liberal outlay, no corresponding income can be realized, we should see less land overrun with bushes, and lying useless and unfruitful. His system of rotation, we think is good, probably as profitable as any that can be adopted. His corn is planted nearer together than most farmers approve of, but his certainly looked well enough to justify his theory. We hear many farmers say that their land is worn out and useless. This is not the case, but is more likely to be run out by neglect and idleness. Mr. Adams has paid out in the twenty-four years, in addition to ten thousand five hundred and four dollars for labor, sixteen hundred dollars for manure, and in the result we see what can be done by untiring and well directed industry.

EZRA KENDALL.

Statement of Abel F. Adams.

Gentlemen:—The farm which I offer for your inspection, I purchased in 1830. It contains about one hundred acres, and is divided the present year, by estimation, as follows, viz.:—Woodland, sixteen acres; pasture, thirty acres; mowing, thirty-eight acres; corn, five acres; potatoes, corn-fodder, garden vegetables, two acres; rye, five and a half acres; oats, two and a half acres. Some of the land used for mowing is dry, and has suffered severely the three last seasons with drought. My pasture land has nearly all been ploughed and

tilled, which I consider the best way of subduing bushes, where the land will admit of the plough. Where the sod is very tough, I have generally planted potatoes the first year, corn the second year, then follow with oats and stock down to grass. I have sometimes improved pasture land by ploughing in summer, applying a few loads of compost, sowing rye, and grass seed in September, and let the cattle have the whole. The rye produces abundance of feed the next season, and on light land I think is very profitable. I usually plough from two to five acres of my mowing ground immediately after haying, sow rye upon the furrow in September, and usually have a fair crop. Last year I obtained twenty-nine bushels per acre of the white rye, (without manure,) on land that had been mown eight years. In the spring I plough in the stubble with the Michigan plough, seven inches deep for corn. If the land is light and warm, I prefer to spread the manure (in compost) and harrow it in. If the land is wet and cold, I prefer to manure it in the hill. My crops of corn are not as large as I sometimes see reported, but I think I can improve my farm more by raising one hundred bushels of corn on two acres, rather than by *trying* to raise that amount upon one acre. For potatoes I plough greensward early in the spring, spread green manure upon the furrow, harrow it in, apply a mixture of plaster and guano in the hill, and if I plant dry land, plant early and dig early, I usually escape the rot. My stock is now light. As I was about to repair my barn, I sold a large portion of my cows in the spring. I keep one yoke of oxen and one horse. For cows and heifers I prefer the Durhams, as they arrive at maturity early, and when you cease milking them, they make more beef than any other breed. My swine for the last few years I have bought. I have tried the Suffolk, but think the full bloods too small to make pork for market; for although the pork may be very nice, the purchaser generally pays by the pound and not by the breed. In the fall of the year I feed my swine in the following manner: I have a kettle that holds about a barrel, I fill it with small potatoes, windfall apples, and pumpkins, if I have them; when they are boiled, I put in twelve quarts of meal, mash fine, adding sufficient water to fill the kettle. I usually raise a small patch of sweet corn to feed to them green. I keep their beds well supplied with straw, and their yards with

mud, loam, weeds, &c. My largest barn is ninety by thirty feet, with two sheds adjoining. It has a cellar under the whole of it eight feet deep. It contains stabling for thirty head of cattle and three horses. The main stable for cattle is upon the back side. The cattle enter the stables from the cellar at the centre of the barn, and pass each way. The manure is passed through the floor, and in the summer season, is levelled and covered with mud or loam, once or twice a week. I have another building fifty by thirty feet, used for barn, slaughter house, and storage for carts, wagons, tools, &c. It has stabling for ten cattle. My apple trees have been much troubled with borers, and from some cause, many of them do not bear the kind of fruit for which I paid the nurseryman. I usually hire two men for eight months, paying fifteen or sixteen dollars per month and board; I also have occasional help by the day. I sometimes employ one man in the winter, and occasionally get along a part of the time alone. If my statement has not been sufficiently explicit, a multiplicity of cares must be my apology.

Fitchburg, September 10, 1855.

NORFOLK.

Report of the Visiting Committee.

The committee upon the general condition of agriculture in the county, are obliged, from circumstances beyond their control, to make a limited and imperfect report.

The high prices of all agricultural productions last spring, induced the farmers to bring into cultivation as much land as their means would allow. Some went beyond this limit, and reaped disappointment. Nothing is harder than to convince men that the course they and their fathers have long followed, may not be the best in the present circumstances; or that the profit from three acres *may* be equal to what they have usually received from five. No theory of farming, however cunningly framed, can disturb the convictions of education and experience. It is only by noticing the results of their neighbors' efforts, that they can appreciate the importance of a method different from that to which they have been accustomed. We

have seen this season two fields separated only by a road—the situation and soil of both, the same. One produced seventy-five bushels of corn to the acre; the other was judged by its appearance before harvest likely to yield twenty-five bushels. The former belonged to a man whose whole land comprised but a few acres; the latter to a farmer who counts his acres by the hundred.

This is a specimen of what is seen in every part of the county; although it would be wrong to deny that a manifest improvement is in progress. There is no doubt that a hundred bushels of corn can be raised on one acre with no more expense and labor than are originally laid out to raise the same amount on three acres. Intelligent farmers who see this, are not slow to appreciate the advantages of a process that saves so much labor. The same, or a similar remark, may be made of other crops. The pith and marrow of the improvement now most desirable, and now in fact beginning to be made, consists in concentrating all the energies and means of the farmer upon narrow limits, and practising the highest and most thorough kinds of culture. In other words, the nearer farmers approach to the practices of gardeners, the greater the probability of success.

In our intercourse with farmers, we have usually found a ready acknowledgment of the correctness of this doctrine. When the truth is seen and felt, it will not be long in finding a practical application. Such facilities exist for the diffusion of information, that experiments successfully tried soon reach every portion of the community interested in them. We are reminded by this remark, of the extended use of guano. But a few years ago it was looked upon with distrust by many of our best farmers, who could not imagine how so small a quantity of manure could contain fertilizing elements sufficient to supply the demands of the growing crops. Such skepticism was natural, and wise in man, whose means would not allow of expensive experiments upon doubtful conditions. By gradual advances guano has made its way into every town in the county, and during the past season large quantities have been used. How large we cannot tell; but we know of towns in which scores of persons have employed it, with various results, as might have been expected. So powerful an agent, used by persons unacquainted with its nature, must necessarily, in some instances, have been unwisely managed, and of course disap-

pointed the expectations formed of it. This is the price paid for wisdom. But from numerous inquiries we learn that in most cases it has been attended with satisfactory results; especially upon dry and loose soil. We anticipate a rapidly growing demand for this article, not only because it is more condensed and therefore more easily and uniformly applied than other manures, but also, because it will be found cheaper than any other, taking into account the duration of its influence. It is earnestly to be desired that farmers will keep minute records of their experiments with guano, super-phosphates, and other concentrated manures, and publish both successes and failures for the public instruction. More questions have been asked of this committee for information in regard to the character and method of using guano, than in regard to any other, perhaps all other agricultural topics, indicating a wide-spread interest.

The increased attention paid to farming implements and buildings is very noticeable in almost every direction. The saving of labor and manure, the comfort and growth of cattle, the amount and quality of hay, the preservation of roots, are all facilitated by good farm buildings, to say nothing of what might justify extended notice, the gratification of a pure taste.

In farmers' families also is seen the influence of good and bad, of convenient and inconvenient buildings—their influence upon the amount of labor, the comfort and happiness and health of the various individuals. We often hear from the housewife, "this kitchen is well contrived to do work in; or, badly adapted to that end." What a world of difference is here. And how surely must it tell upon the temper and character of those who spend so large a portion of their lives there. Whatever facilitates labor in the house, promotes order, neatness and comfort. How these react upon the taste and feelings of the family, does not need to be shown. We have sometimes thought that farmers, whose chief business is out-of-doors, did not always sympathize so much as they should with their wives and daughters, whose labor is fully as severe as their own. We hope we mistook. At any rate, it is not amiss in us to invite the attention of farmers to such an arrangement of their houses and other buildings as will render domestic labor as easy and pleasant as possible.

The barn-cellar commends itself so powerfully that no new barn is found without it; and the farmer who sets himself defiantly against it as a needless innovation upon old usages, finds his neighbors going beyond him in all the elements of prosperity. One man assured us that he could not be persuaded of its necessity, until he saw that those who had cellars, in a few years began to sell hay. The manure heap is a bank that never refuses liberal discounts.

We have seen in several places a new interest in raising horses. This is a business that has not heretofore been much practised in this county. But in almost every direction we observe fine young horses, that will soon pay a handsome profit. The late exhibition in Dedham, in connection with our annual fair, showed the feeling that exists in reference to horses, and has served to stimulate the efforts of our farmers in this direction.

It may also be observed, that, notwithstanding the objections brought against fine, high-bred stock, on the score of expense and want of adaptation to our climate and soil, yet the number of such cattle has largely increased during the past year. Not perhaps with the design of maintaining entire herds, so much as the improvement of our native breed by judicious crossings. But cattle require food; and scarcely any subject presses more closely upon our farmers than that of the summer keeping of their stock. Many old pastures are abandoned to wood and bushes, and others are grown over with moss. Farmers tell us that they must reduce their stock, or improve their pastures, or find a substitute for grass. Many are skeptical as to the expediency of renovating a worn-out pasture, and others think that they cannot afford the expense. Some experiments have been made, probably in every town, which show that to break up, manure, and seed down old pastures, is as profitable an investment of money as a farmer can make; especially if he lives within a milkman's route. It would be a benefit to the agricultural community, if those who have done most and best in this line would send the detail of their operations to the newspapers, or incorporate them with the transactions of our society.

We find but one opinion among farmers as to the profitableness of corn-fodder, as a supplement to the pasture. It comes just when the pasture begins to fail, and furnishes a grateful and

valuable food. It is believed that an acre of good land, well cultivated, will yield twenty-five tons of green fodder, or seven tons of dry. Every year the culture of this article is extending itself. We would observe, that the sweet corn furnishes the most profitable fodder; not so large and heavy as some other kinds, but more tender and nutritious, and so agreeable to cattle that they eat it with little waste.

It would require too much space to detail the numerous instances of reclaiming bogs and meadows, that deserve to be mentioned. In every direction we see this work going on, from small lots to acres; and in every case, the particulars of which have come to our notice, with decided profit. One farmer has reclaimed and improved ten acres, within two years, at an expense of $1,500, and this year has cut thirty tons of good hay. This is an illustration, on a somewhat large scale, of what is done in hundreds of instances on a smaller scale. Several individuals have observed to us, that they had just discovered they had hitherto been neglecting the most valuable part of their farms.*

At the commencement of the season, the prospects of farming were very promising—but the promise was not realized. The crop of hay was considerably less than usual. In most places potatoes yielded a fair crop, of good quality and tolerable amount. The rot was less extensive than for several years past. We look with satisfaction upon the efforts of farmers to multiply and prove new varieties. Experience shows that the tendency of all sorts of potatoes is to degenerate in quality by long cultivation. Hence the necessity of frequent change of seed and change of locality. The early frosts damaged the corn to a large extent, and proved a serious loss in this most important crop.

*We cannot help referring particularly to the improvements effected by Capt. Asa Pickering, of Bellingham. This gentleman's valuable farm was, sixteen years ago, wholly uncultivated, covered with bushes and bogs. By almost incredible labor, with his own hands, he has made a beautiful and profitable farm—beginning the enterprise after his fiftieth year. Using the hand hoe, he turned over five or six acres of bogs and hassocks, then carted in gravel and manure. These mowing fields are now in admirable order. He has also built a large covered drain across his farm, besides almost fabulous quantities of stone wall. This labor has been well directed, and is every way creditable to Mr. P.'s ability and judgment. He is still in a vigorous old age, and in walking over his farm, and showing, with honest pride, his extensive improvements, can without difficulty tire out much younger men.

In our visits to the farmers, we everywhere meet a cordial welcome, and receive abundant information of the details of their operations. Everywhere we found gratifying evidences of the benefits conferred upon the agriculture of the county by this Society. We are convinced that a powerful impulse has been given to the labors of the farmer, by the information it imparts, by the spirit it diffuses, and by the annual fair, which brings together the yeomanry of the county to compare notes, and to exhibit the results of the year's work. Although the productions of the farm have not this season reached their usual amount per acre, yet, in consequence of the cultivation of a larger number of acres, the total value of agricultural produce is probably as large as ever. It would gratify us to go into details upon several topics included in this report; but we should find it difficult to make such discriminations as would be satisfactory to our numerous friends, unless we protracted this notice to an unreasonable length. We have seen much to encourage the efforts of those who would bring farming into the best repute, as an exact science and a profitable employment.

In the course of their observations, the attention of the committee was directed to a fine bed of carrots, on the grounds of the Hon. Marshall P. Wilder, of Dorchester, some notice of which we deem worthy of record in the Transactions of the Society.

These carrots were in rows—with alternate rows of nursery pear trees intervening—at the distance of four feet apart. Half of them were of the White Belgian variety, and half of the Orange Red. The whole space occupied by the trees and the roots was 8,200 square feet of ground. The soil had been entirely exhausted by the previous use of it; and, in order to restore it to the highest tilth, was dressed, last fall, with 800 lbs. guano and six cords of stable manure. It was then ploughed deeply *six* times, and again *four* times in the spring. The trees, of which there are 3,600, had made vigorous growth; and of the carrots there have been harvested 180 bushels, weighing, on the public scales, 9,000 lbs. This is equal to 956 bushels, or more than twenty-one tons to the acre. Had the carrots been sown in the usual manner—in rows two feet apart—the yield would have been more than forty tons per acre; and at the present

price of these roots, would afford the handsome return of six hundred dollars.

If we add to the actual yield of carrots the value of the nursery trees grown upon the same soil, we shall readily understand the propriety of such heavy manuring and frequent ploughing as this small plot of ground has received. We shall learn too, again, the often disregarded fact, that a liberal outlay alone insures, under ordinary circumstances, a large return.

J. M. Merrick.
C. C. Sewall.

PLYMOUTH.

From the Report of the Supervisor.

Two entries were regularly made in 1852, for the premiums offered for the best cultivated farms, made payable in 1855. Both applicants have withdrawn their claims, stating that the requisition to keep an accurate account of the expense of cultivation and the annual products of the farms, required more labor than they were willing to perform. It is hoped the reluctance of farmers to comply with stated conditions will neither induce the Trustees to relax their conditions, or omit offers of a class of premiums from which more extensive and salutary influences may be expected, than from any other. A knowledge of the management of entire farms has been deemed, by agricultural societies generally, as of the highest importance to the progress of improvement. Few, if any, of the societies, in the early periods of their existence, have neglected to offer liberal premiums for the best cultivated farms; but many of them have been discouraged from the continuance of them, in view of the very imperfect and unsatisfactory statements obtained. Different methods have been adopted to bring out clearer views of the actual management of farms. In some instances, a series of questions has been proposed which applicants for premiums were required to answer. The answers have generally been too laconic to give the reader any clear views of the applicant's system. Some societies have depended chiefly on receiving and communicating information through visiting committees; but

committees necessarily become far better acquainted with results than the means through which they were produced. We suppose the course adopted by this society, of requiring an account of the expense of cultivation and the products of the farms through a succession of years, as good a means of advancing improvements as can at present be pursued. It might be well to present the farmers with an additional money motive, by raising the amount of the premiums offered.

MORRILL ALLEN, *Supervisor.*

BARNSTABLE.

Statement of S. B. Phinney.

Among the inducements offered by the Barnstable County Agricultural Society to the farmers of Cape Cod, is a premium for an economical improvement in the cultivation and management of an entire farm. The undersigned begs leave to submit the following statement, for the consideration of the Executive Committee, of his farm, situated in Barnstable, containing about twenty acres, believing that they will readily discover marks of improvement upon it during the time he has owned it :—

I came into possession of ten acres of my farm during the year 1850, and since that time some ten acres adjacent thereto have been added. At that time six acres were composed of upland which had not, for a great number of years, been cultivated, and was found unproductive and of little value, except as poor pasture or grazing for cattle. About three and a half acres was of low, swampy meadow land, filled with bushes and briars, and from which my neighbors were in the habit of cutting pea sticks. My first labor upon the swamp was ditching, in order to drain the water that stood upon it through a considerable portion of the winter months. I then cut and burnt off the brush, and during the month of August, 1853, I commenced ploughing with a heavy plough, and turned over between two and three acres. It was ploughed deep, turning under with a strong team all the roots laying thick upon the surface. I then commenced carting in loam or sand, covering it over to the depth of three inches, and harrowed the whole most thoroughly, pulling out all the roots not covered. In September following, I covered

the whole with a coat of compost manure, and by the middle of the same month sowed it with grass seed—using at this time only herds grass and red top. The seed, owing to the heavy rains which followed in October, did not take well, and in the succeeding March, 1854, a quantity of clover, with an additional quantity of herds grass was sown. These took well, and the result was that three and a half tons of a good quality of hay was cut in the month of July of that year. In the spring of 1855 another coat of compost manure was applied over the meadow; and upon the higher ground about it, a coat of guano was applied with the happiest results. It was again mown in July last, and over six and a half tons of the best quality of herds grass and clover hay was cut. A sample of the herds grass I herewith present to the committee, which measured *six feet* in height when cut.

The estimated cost of reclaiming the meadow is		$150 00
1854—Receipts from four tons hay at $14 per ton, ...	$56 00	
1855—Receipts from six and a half tons hay, at $16 per ton, . .	104 00—	$160 00

Thus it will be seen that in two years the receipts have more than paid for the whole cost of labor. My experience in reclaiming meadow land leads me to the belief that it is more practicable for the farmer, when reclaiming similar lands, to sow them down to grass instead of cultivating the same, as is usual, by planting with corn or potatoes two or three years. Every time the earth is removed by the plough, the wild roots are disturbed before they have become decomposed, and cultivators find it difficult to control them.

I would also invite the attention of the committee to land which I purchased of David Bursley, Esq., in the spring of 1854. A portion of this land was poor and unproductive when he came into possession of it, but while under his skilful management was made as productive as any grass land in this section of the State. He had successfully restored it, by ploughing in frequent green crops of millet. The first year I purchased of him, one acre yielded three and a half tons of hay, and in July, 1855, from two acres I cut more than six tons of hay; and here let me add,

that from five and a half acres of my farm, that had not been mown within the memory of man, until the time stated above, I have cut twelve and a half tons of hay, which was valued at $16 per ton, $200.

Other portions of my farm have been made productive by ploughing under greensward, manuring the same after ploughing, and immediately sowing it down to oats and hay seed. In this way old and worn-out pasture lands have been restored to good feed. By the use of guano on an acre of land ploughed and sown to grass, I have found beneficial results. Where the best of compost manure had been applied side by side (three tons to the acre) with guano, it was found that the crop where the guano was spread was nearly a quarter larger. It is evident, however, that manure is "the farmer's capital," and farms worn out, or meadows requiring to be cultivated, *must be well manured.* The farmer who most thoroughly devotes his attention to making manures will reap the most bountiful crops, and be the most richly paid for his labor.

In conclusion, I have to ask that the committee will examine, with some care, the meadow which I have reclaimed, with the hope that they may be enabled to stimulate the citizens of Barnstable County to renewed activity in the restoration of thousands of unproductive acres of meadow land within her borders.

All of which is respectfully submitted.

S. B. Phinney.

Barnstable, September 25, 1855.

RECLAIMED MEADOWS.

The inducements offered by most of the societies for the permanent improvement of land, are comparatively small, and yet, looking to the real and future prosperity of the State, one would suppose this to be the point of all others where the full influence of a society should be exerted. A chance animal, or a fancy article, prepared for exhibition, may be all well enough in its way, and such exhibitions should, perhaps, be encouraged. But the

aggregate amount awarded for reclaiming meadow and swamp lands in the State, during the past year, was but $142; for draining, but $15; and for experiments with manures, but $62; while the amount awarded for ploughing at the exhibitions was $909,14; and the aggregate amount awarded for objects which were not in any way connected with agriculture, like pin cushions, baby jumpers and rabbits, was no less than $1,591.63; and yet these last are but the objects of a day, while premiums given for reclaiming waste and unsightly lands, meadows, swamps and pastures, for planting ornamental trees, orchards or forests, add not only to the future wealth and prosperity of the State, in so far as they themselves go, but they place examples of thrift and improvement before the eyes of many whom the influence of the society cannot otherwise reach, who stand aloof from the exhibition, but who, seeing the complete success of an experiment in draining or reclaiming a bog, would be led to go and do likewise; and so the influence goes abroad, unseen, unfelt at the time, but none the less active and powerful, working a gradual revolution, drawing in, unconsciously, even those who do not believe in associated effort, and thus accomplishing the real and ultimate purpose for which an agricultural society is established, and patronized by the government.

Let the societies all give a powerful impulse in this direction, by the offer of large and generous premiums for the encouragement of permanent improvements like reclaiming waste lands, and the transplanting of fruit and ornamental trees, or otherwise, and a few years would show what each society had done; the influence would be seen, our agriculture would be vastly improved, beautiful trees would adorn our villages and homesteads, and the country would be more attractive to the young, and farming, more agreeable and productive.—Ed.

ESSEX.

From the Report of the Committee.

Your committee are of opinion that Mr. Payson's statement relates with remarkable exactness the details and result of a very interesting experiment. It shows how meadow lands may be reclaimed by persons who cannot afford to make expensive

outlays, and wait years for the profits. There are many meadows in this county, owned by just such persons, which now serve only to contaminate the air by their unwholsome exhalations, and are of no profit to their owners, but which may thus be changed permanently into the most productive and profitable parts of the farm, by a process which will not only pay its own cost yearly, but will actually yield a profit.

We suggest that if Mr. Payson had mixed his guano with a liberal portion of gravel, before applying it, his experiment would have been more complete. We noticed that where gravel had been applied, on the north side of his meadow, the grass put forth more vigorously than elsewhere. No soft meadow will continue for a long time level and smooth without gravel. It gives firmness to the soil, and solidity of texture to the grass.

Mr. Osborne's meadow, which we viewed on the 6th of July, is part of a farm which, four years ago, looked as uninviting as rocks, and woods, and rugged steeps could make it. But with untiring industry and perseverance in overcoming obstacles, directed by skill and good taste, he has made the desert blossom as the rose.

His meadow differs widely from Mr. Payson's. It might, perhaps, be called *swamp swale land*, and lies so high that some persons might doubt whether it comes within the rules of the society. Your committee, however, conclude that it does. It was rugged and hard to reduce, but it has yielded to Mr. Osborne's indomitable energy and skill; and when we saw it, this unpromising, unsightly swamp was drained, cleared of bushes and stones, and had become a well cultivated and productive spot.

It will be seen by Mr. Osborne's statement, that he has spent much profitable labor upon it. He has kept no other team than a single horse, which has performed all team labor, excepting the first ploughing. We were astonished to learn what an amount of rough, severe labor could be accomplished, without any injury to the animal, by one horse, judiciously trained and managed.

JOHN KEELEY, *Chairman.*

Statement of Thomas E. Payson.

The particular piece of meadow which I offer for premium, is that upon which potatoes were grown in the summer of 1854. Its limits were pointed out to you when you were upon it. I offer no other part of the meadow, for two reasons; one is, because I am unable to state with accuracy the cost of the improvements or the produce of the land for two successive years, and therefore cannot bring myself within the rules of the society: the other is, that the experiment upon this lot has been much more successful and less expensive than any other which I have thus far tried, and, therefore, I am able to offer it for your consideration under the most favorable circumstances.

The piece contains two acres and two-thirds, and nearly or quite the whole of it is first rate peat. Previous to 1854 nothing grew upon it, except the very fine, short, wiry meadow-grass, which is characteristic of the toughest peat bottoms. Its value for hay would have scarcely paid the expense of cutting and curing.

In the winter of 1854 about thirty cart loads of manure were hauled upon it. This was carried upon the meadow just in the state in which it was thrown out daily from the cow-house, and was made up, at least three parts in four, of salt hay or thatch, with which the cattle were littered. It was planted with potatoes in the spring, in the following manner:—

The manure is first spread on the surface of the meadow, in beds about four feet wide, leaving a space between them about one and a half feet in width. The seed potatoes are then laid upon the beds within twelve or fifteen inches of each other. I have used small potatoes for seed, or such as were considerably below the medium size, for a number of years past, and uniformly with good success,—always excepting those years when the crop has failed by reason of the rot. The one and a half foot space between the beds is then dug about the depth of one spit of a sub-soil spade, and the sods and mud taken from it are thrown upon the beds. If this is properly done the whole surface of the bed is well covered and sufficiently deep for all practical purposes. Each man, as he digs his trench, covers the half of the bed on either side of him which is nearest, the next man doing the same, and so on. When the potatoes make their

appearance, (as they certainly will—no matter how tough the sod may be which covers them,) they must be *earthed up*, as it is termed. No matter how well the work has been done, the sods and mud, after exposure to the sun and air for a little time, will shrink and shrivel, so that the wild grass and weeds easily find egress in many parts of the bed. This wild grass must be pulled up and the interstices filled with mud from the bottom of the trenches. The potatoes planted in this mode are always vigorous in their youth, and grow so rapidly that, in a few days after being thus "earthed up," their leaves completely shade the entire beds. They thus almost or altogether destroy all the meadow grasses in a single season.

When the potatoes are dug, the vines and the covering sods are thrown back into the trenches. The surface, for the time being, is thus left smooth and level, although, as the vines decay and the earth settles and becomes compact, the lines of the trenches are always marked by a slight depression. Grass seed is then sown, at the rate of one peck of herds-grass and half a bushel of redtop to the acre. The grass seed was sown on this piece of meadow during the month of September. Early in the spring, clover seed, at the rate of eight or ten lbs. per acre, was sprinkled over it.

In May three cwt. of Peruvian guano, and three cwt. of De Burg's super-phosphate of lime, were sprinkled over it. The ditches which are around it were dug many years ago, but I have estimated them at their full cost.

So much for the course of management, and now for the results.

Two and two-thirds acres meadow in account:—

Dr.

1854—To Draining,	. . . . .	$20 00
Manure and hauling,	. . . .	50 00
Seed potatoes,	. . . . .	40 00
Grass seed,	. . . . .	5 00
175 days' labor,	. . . . .	175 00
		$290 00

Cr.

By 300 bushels potatoes, at $1, ...	$300 00
75 bushels small potatoes, at 50 cents, . .	37 50
	$337 50

Thus it appears that the crop of potatoes paid for itself, paid for putting the land into grass, and the interest on $250 an acre besides. It was a very good crop of potatoes, and the market price, as will be recollected by every body who bought or sold, was extravagantly high. The experiment was, therefore, made under the most favorable circumstances.

Two and two-thirds acres meadow in account:—

Dr.

1855—To 3 cwt. guano, ...	$8 00
3 cwt. super-phosphate, ...	7 50
Clover seed, ...	3 00
Labor, ...	13 00
	$31 50

Cr.

By $3\frac{1}{4}$ tons hay, ...	$65 00
Value of after-grass, ...	8 00
	$73 00

Thus it appears that the crop of grass paid for itself, for cutting and curing, and the interest on $250 an acre besides. I have stated the quantity of hay at one and a quarter tons per acre, because I did not weigh it, and mean to be below rather than above the true weight. Nobody who saw it estimated it at less than a ton and a half to the acre, and many practiced eyes rated it higher. You yourselves saw it but a short time before it was cut, and can bear witness whether I have over or underrated it.

I, perhaps, owe you an apology for stating my mode of planting potatoes with so much particularity. I have done it because I have found that all farmers are not familiar with it. If I mistake not, some members of the committee had never seen potatoes so planted until they saw them upon my meadow.

Nor do I state it because I think it the *best* mode of converting fresh meadows into English grass lands, for I have no doubt that in all cases when it can be done it is best to plough them. Neither can I be charged, in this particular, with preaching what I do not practice, for I ploughed ten acres of meadow last fall, and have just finished between twelve and fourteen this fall. I plough with a pair of wheels, so as to keep the off ox out of the furrow, chaining the plough to the axletree, inside the off wheel. I use one of the largest road coulter ploughs, with a drag cutter, (a wheel or circular cutter may be better,) made by Ruggles, Nourse & Co., which turns a furrow averaging a foot in depth and something over two feet wide. But I am travelling out of the record. To return, I have to say in favor of this mode of planting potatoes,—which is akin to the "lazy bed system," as it is termed on the other side of the water,—that when a meadow is so situated that it cannot be ploughed, I have no doubt that this is the best and most economical mode of changing it into valuable grass land. It would be well, too, if a man has not a very large quantity of such land, and is not in too great a hurry to convert it into grass, to plant it more than one year, running his trench the second season through the middle of the bed of the first. Perhaps three seasons would be still better, for then the whole land would be thoroughly worked and its character completely changed, and every trace of its natural product entirely obliterated. But if a meadow is thoroughly drained, and so situated that it can be ploughed and grass seed sown upon the furrow, a victory has been gained over it, the benefit of which cannot be taken away until the drains are choked and the meadow again saturated with water. It only needs a little subsoil from the high lands, all the better if it be inclined to clay, or gravel, or common sand even, when nothing better is at hand, to produce remunerating if not abundant crops of the best grasses for an ordinary lifetime.

Rowley, November 15, 1855.

Statement of William Osborne.

The meadow I offer for premium contains two acres and ninety-eight rods, which I commenced clearing in the fall of 1852. It was then covered with alders, pines, blueberry bushes,

cedars, wild rose bushes, swamp whortleberries, &c., and was so wet as to make it difficult to plough; soil varying from gravelly loam to black mould, having for the most part a clay bottom. After cutting off the wood and bushes, I ploughed it with four heavy oxen, and by repeated cross-ploughing, harrowing, and digging out the stumps, I have got it into a condition for root crops of almost any kind.

The first year I planted it mostly with potatoes, and lost the principal part of the crop by the rot. Before planting, I ran a ditch through it, stoned and covered it. In 1854 I planted it with potatoes, corn, squashes, pease, beans, cabbages, ruta bagas, and sugar beets, from the most of which I had a good crop. But not then thinking of offering it for a premium, I did not keep any account of them, but I hesitate not to say, that, with the brush cut off the land and made into faggots, with the crops, it considerably more than paid the expenses of the first two years.

This season (1855) I ran another blind ditch through it, and planted it with corn, potatoes, beans, pease, squashes, ruta bagas, sugar beets, carrots, cabbages, and flat turnips. The early potatoes yielded well, and were dug and sold in July, at from 9s to 10s 6d per bushel. Corn being planted between the rows the late ones did not yield well. There was also a failure in the pease, which I think was caused by the use of guano; they ran very much to vines, and the pease mildewed.

Expense and Profit:—

Dr.

To 358 days' labor of man and horse at 75 cents per day,	$268 50
4 days' hire of ox team,	22 00
¾ day, horse team,	3 00
In 1855, about 6 cords of manure,	24 00
½ bag of guano,	1 75
8 bushels of ashes,	1 00
95 apple trees, at 16 cents each,	15 20
	$335 45

Cr.

1,536 faggots, at 2½ cents each,	$39 40
5½ cords of wood,	34 12
CROPS GATHERED IN 1855.	
67 baskets of corn,	33 50
Early potatoes, pease and beans sold,	41 20
40 bushels of potatoes stored,	30 00
4 full horse-cart loads of sugar beets,	20 00
1 large wagon load marrow squashes,	20 00
1 bushel of dry beans,	2 00
1 " of pease,	2 00
Corn fodder,	20 00
350 cabbages, not gathered,	17 50
Carrots not gathered,	20 00
Ruta bagas not gathered, and flat turnips,	15 00
	$294 72
At the lowest estimate of crops of 1853 and 1854,	150 00
	$444 72

LYNN, November 14, 1855.

WORCESTER.

From the Report of the Committee.

By referring to Mr. Fay's statement, it will be observed that for several years he labored on his ground with little success, after which he adopted the true and only successful method, to subdue such land, that is, to drain it. To do this, he was under the necessity of opening, at great expense, a course for the water to pass off without regard to its old channel. This opening is seventy rods in length, seven feet wide, and from two to seven feet deep, varying according to the surface. A part of this ditch passes through a bed of sandy loam, which made an excellent top-dressing for the swamp, where it was used in 1852, at which time Mr. Fay commenced the operation he speaks of in his statement.

Mr. Fay entered ten acres of swamp land. This he has placed in four divisions, no two of which were treated in precisely the same manner, giving to the public the benefit of his

experience in the different modes of subduing the bog. Two of these lots, one being in grass and the other in oats the last summer, are already reclaimed; the other two are in different stages of subjugation.

The lot containing one acre and ninety-two rods, yielded this year more than two and a quarter tons of good hay to the acre, where, but a few years since, little of value grew. The product of this lot, the present season, has been nearly sufficient to cover the whole outlay of eighty dollars in reclaiming the same. This is a fact worthy the consideration of our intelligent yeomanry, and, assured of like success, holders of bog meadows and peat swamps, of which there are acres upon acres in the county of Worcester, should not fail to make a like increase in the value of their real estate.

One great object this society had in view in offering so generous premiums, as awards for a man's skill and labor, resulting in his own benefit, was that others might be benefited by his experience, which should be communicated in a written statement, setting forth all the facts in the case, especially those touching the expense, labor, &c. This is a special requirement, and we regret that these particulars were not entered into by Mr. Fay, in his general statement, which, as it is, we consider valuable to the public.

THOMAS W. WARD, *Chairman.*

Statement of Josiah Fay.

Gentlemen:—The land to which I would invite your attention consists of about ten acres of reclaimed bog meadow. About eight or nine years since, I commenced ditching it, working upon it at various intervals, till, in 1852, I completed the drainage by turning and lowering a brook which ran across a portion of it. The value of the material taken from these ditches was sufficient to pay the expense of digging.

The same season (1852) I ploughed up about an acre and a half, and the next spring planted with potatoes. The next season I planted the same with corn, manuring with compost in the hill, and had about forty bushels to the acre, which was probably one-third less than would have been the case had it not been for the injury caused by the wire worms. Last spring

I added to this about half an acre previously burnt and gravelled, making in all four rods short of two acres, sowed with oats without manure and seeded down. The expense of reclaiming I estimate at twenty-five dollars.

In the fall of 1853 I ploughed another acre, and the next spring wheeled on sand and loam, covering the surface about an inch thick, which, together with ninety-eight rods planted with potatoes the year previous, making in all one acre and ninety-two rods, I sowed with oats and seeded down, and this year cut from the same, three tons and 1,140 pounds of hay. Expense of reclaiming, eighty dollars.

Four acres, a part of which was thickly covered with birch and alders, and the rest with brush, were cleared, and the brush burnt in 1853, at an expense of about thirty-two dollars; the value of the wood obtained, nine dollars; leaving a balance of twenty-three dollars expense. In the summer of 1854 I burnt the sod of this, and two additional acres, covered with meadow grass, and ploughed the same in the fall. Last spring I again ploughed it, planting five acres with potatoes, corn, and corn-fodder, without manure, and, from what I have dug of the potatoes, judge that the yield will be one hundred and twenty bushels to the acre, though the crop is somewhat reduced by the water standing between the hills in that rainy weather in July. The fodder was a first rate yield; but I could not estimate the amount on account of having fed it out to the cattle from day to day. The corn will probably be from forty-five to fifty bushels to the acre.

One of the above mentioned six acres, which I did not plant last spring, has since been ploughed, and is ready for tillage or seeding down, being fully reclaimed. The amount of labor bestowed on these six acres, since 1854, I estimate at forty-five dollars, which, added to the previous twenty-three dollars, makes the whole expense of reclaiming sixty-eight dollars, being about two-thirds less per acre than the average of the other two pieces, owing to the deep and thorough burning of the sod, while the ashes also give a body to the soil, which will obviate in part or entirely the necessity of gravelling when seeded down.

LANCASTER, September 28, 1855.

PLYMOUTH.

Statement of Josiah L. Bassett.

I have two and one half acres of land, most of which, in July 1854, was so low and wet that it was almost worthless. I commenced ditching it in August following, and drained off the water. I can give an accurate statement of the method and expense of reclaiming only one acre and thirty-two rods. The mud on that part is from two to five feet deep. Most of it was covered with swamp whortleberry bushes, which had been mown once in about three years. In June last it was dug over with bog hoes, made sharp as an axe. It took twenty-six days' work, at $1.25 per day, to dig it over and clear it of stumps. In August I hauled off the stumps, and piled up the turf and burnt it. The ashes were spread on the ground. That is all the manure I have used on the acre and thirty-two rods, which, I think, is equal to any thing else to make grass for two years. The stumps paid for hauling off. It took thirty days to burn the turf, level the ground, spread the ashes and work them in, which was done with a horse and cultivator, and hand rakes. The burning and finishing was light work, and I call it $1 per day, which makes $62.50. I charge nothing for ditching, as the mud more than pays that expense. The rest of the land I ploughed, excepting about sixty rods, which was used as the other, and was done the year before. There was less depth of mud where I ploughed, and but few bushes, and there being but little to burn I hauled on seventy loads of compost manure from the yard, which, I think, was not more than equal to the ashes on the other part. I think the land I ploughed, reckoning the expense of the manure at fifty cents a load, would not vary much from the other in expense as finished. The grass seed was sown the 31st day of August, timothy and redtop. I have prepared about five acres before, in different ways, and am not in favor of hauling on gravel and other worthless stuff from highland, but had rather ditch and drain thoroughly.

IMPROVEMENT OF WASTE LANDS.

ESSEX.

From the Report of the Committee.

In the opinion of the committee, the premiums offered for the improvement of pasture and waste land, stand in importance at the head of all the premiums offered by this society. The pastures in Essex County have by neglect become about one-quarter waste land, and something should be done to stimulate their owners to see to it that they do not become almost or entirely valueless. In riding over the county, it may be noticed that many pastures are gradually becoming covered with juniper, savin, birches, and other bushes and trees. It is to be regretted that a line of distinction could not be drawn between the pasture and forest; whereas now it is with difficulty that they can be distinguished. The stony parts of pasture land may advantageously be covered with a growth of pines or locusts; but lands adapted to pasturage, and appropriated for that use, should be kept free of bushes and moss. By ploughing and improving such land, we have better cows, and fatter cattle; more milk, and stronger oxen.

The experiments entered for premium this year, seem to be rather in the renovating of waste land to a state of cultivation, than in the improvement of run-out pastures, so as to make them more productive and valuable for summer feed. The statements of the claimants are so full, that they tell their own story.

M. G. J. Emery, *Chairman.*

Statement of Jesse Smith.

I offer for inspection and premium two acres of land, which was originally of little or no value, it being covered with blueberry and whortleberry bushes, lambkill and brakes, with no small quantity of stones. We commenced in September, 1849, to cut bushes, which were burned on the ground, and directly after began a ditch, which we dug one hundred and ninety feet

long, four feet wide, and three and two-thirds feet deep. This part of the lot being low, what we took from the ditch was loam and vegetable mud, and I think was worth twice the expense of throwing out. We then dug a trench five feet wide, in which we built a wall, which, I think, paid the expense of building. We then dug the stones that could be easily removed, and filled the ditch three feet high, which took over seventeen cords.

The amount of labor expended in removing stones and filling the ditch, was three days' work for two men and one yoke of oxen, amounting to $4.50, (I then hired cheap by the month). We then ploughed it, and the amount of labor expended, together with turning over turfs and digging stones, was $10.50. In May, 1850, we began digging and hauling rocks to the trench we had dug for the wall; then ploughed and harrowed it, except one-fourth of an acre which was covered with rocks, roots and water, it being a kind of basin. We then planted it with corn and potatoes, hoed the corn twice and the potatoes once. The potatoes grew finely, but in the fall were an entire failure by the rot. The corn was very good and harvested in September. We then dug a ditch south of what I called the basin, running from west to east, one hundred and fifty feet long, four feet wide, and three and a half feet deep; also two other ditches, running north from the one last mentioned, four feet wide, three and a half feet deep, and forty-five feet long, and one at the end of the two, which carried it through the field. We also dug one from the first to the second, uniting them altogether, and making in the whole, thirty-six rods.

The committee will see two advantages from these ditches; one to drain the land and save the loam, and the other to receive the stones. In May, 1851, we ploughed twice and harrowed it, carried on a little manure, and carried off all the loose roots and sods. We planted it with corn and potatoes, hoed twice, and had an excellent crop. In 1852, we sowed it with barley and grass seed. The barley produced thirty bushels to the acre, leaving a large crop of rowen on the land.

I think the crops of corn, potatoes and barley, have well paid the expense of labor in improving the land. We have since taken off three crops of hay, which have been estimated at five tons each year. If I reckon this hay at $12.50 per ton standing, it

will leave me $187.50 profit. The land, when I began on it, would not pay the interest of $15 per acre, and now I have been offered $100 per acre.

HAVERHILL, August 24, 1855.

NORFOLK.

Statement of Cheever Newhall.

The land I present to the notice of the committee, is that examined by them on the 25th of July last. The lot contains six acres, and came into my possession about seven years ago; it had not been cultivated within the memory of the oldest person in the vicinity, and was covered over with forest trees, consisting of pitch-pine, red cedar, white birch and poplar, together with blueberry, barberry and fern bushes. It remained in this condition until the winter of 1854, when I commenced cutting down the forest trees and mowing the bushes, leaving about fifty of the red cedars standing on the borders of the field; about three-fourths of the lot was ploughed in the spring, and about one-half of the whole planted with potatoes, Indian corn, cabbages and early pease. They grew as well as could be expected on land but partially subdued and in a rough state. The wood and crops were sold; the proceeds fell short of the sum expended on the lot, about one hundred dollars.

This year the whole of the land was ploughed twice and well harrowed; manure to the value of twenty-four dollars per acre applied, spread evenly over the land and ploughed in; in addition to which, manure to the value of sixteen dollars was applied to two acres of squashes, in the hills, which were placed eight feet apart each way—making the whole cost of the manure this year, one hundred and sixty dollars.

My man has rendered an account of the sales of the produce for the year, as follows:—

Potatoes, ...	$115 35	
Squashes, ...	176 00	
Green pease, ...	51 87	
Sweet corn, ...	27 23	
Cabbages, ...	75 47	
		$445 92

Estimated value of ruta bagas, . . .	$15 00
" " corn-fodder, . . .	9 00
	$469 92

I have kept no exact account of the expenses, but believe they will amount to about the same, this year, as the value of the produce, leaving a balance in the two years against this lot of land of one hundred dollars. One acre of the foregoing was sown the first week in September, with herds-grass and redtop, and now promises to produce a large crop next year; the other five acres are in perfect order for any crops.

DORCHESTER, October 31, 1855.

ORCHARDS.

WORCESTER NORTH.

From the Report of the Committee.

Our examination of several orchards has convinced us that potash, as a wash for trees, should be used with more caution than is customary. The orchard of Mr. Works was injured, we think, very much by the potash with which he washed his trees, and Mr. Works agrees with the committee in that opinion; the location of his orchard is good, being well protected against the west winds; the soil on which his trees are planted is well adapted to grow the apple. Where the ground has been well cultivated, which is the case with a part of the lot, the trees have made a good growth; where they have stood in grass they have almost refused a show of leaves—to make wood they could not.

Enoch Caldwell's orchard is situated on Prospect Street, near the summit of the hill, on the west side of the street, nearly level, with a slight slope to the south, rather exposed to winds, but slightly protected on the west by higher land and wood, standing at present. The trees are remarkably even, as to size and general appearance. The orchard contains several varieties of fruit, although that fact is not mentioned in his state-

ment. We consider this orchard almost perfect. When the committee were on this lot, the question came up as to the value of such trees, and it was the unanimous opinion that twenty-five dollars each was not above their value. Is not this an inducement, in a pecuniary point of view, to plant good trees well, and on good ground, well located, and afterwards to cultivate well?

JONAS A. MARSHALL, *Chairman.*

Statement of John Brooks, Jr.

My west orchard was set out in the spring of 1850, the trees being two years from the bud; the soil is a clay loam, with a clay subsoil; it contains 130 trees, twenty-five feet apart each way; the holes were dug eighteen inches deep, and from four to five feet wide. There are fifteen varieties, viz.: 20 Baldwins, 10 Hubbardston Nonesuch, 10 Ladies' Sweet, 10 Lyscomb, 10 Mother, 10 Roxbury Russet, 10 Golden Russet, 10 Jewett Sweet, 10 Danvers Sweet, 10 Fall apples, 5 Moore's Sweet, 5 Pear Russet, 5 Minister, 5 Golden Ball. The piece was broken up in the fall of 1849. In 1850 we raised a crop of potatoes with no manure but plaster in the hill, and the next fall we put two heaps of manure on the piece, containing ten loads each, then spread and ploughed it in, in the spring, and sowed oats; and since then we have manured it light, and sown it with turnips about the first of August.

My east orchard was set out in the fall of 1848, the trees being then two years from the bud. It contains 110 trees, twenty-eight feet apart each way, with a peach tree between every two, set in the spring of 1849, the holes being dug eighteen inches deep and from four to five feet in diameter. There are fourteen varieties, viz.: 25 Baldwins, 10 Golden Ball, 10 Hubbardston Nonesuch, 10 Golden Russet, 10 Roxbury Russet, 5 Spice Sweet, 5 Sweet Russet, 5 Danvers Winter Sweet, 5 Orange apple, 5 Winter, 5 Lyscomb, 5 Swaar, 5 Mother, 5 Crown.

This orchard has been in grass; it was sown to grass, and has been kept so since it was laid down, three years before the orchard was transplanted; nothing of note has been done to the trees since setting, until last fall, when I put five shovel-

fuls of manure around the roots, to keep away the mice and enrich the soil; this spring I turned the sods over three to four feet around the trees, and have washed them twice with potash water. I have been over them four times this season to dig out and kill borers, finding some in every tree,—in some as many as ten;—the last time I went through the orchard I found but few. Mr. Buckminster, of *The Ploughman*, says that washing them in potash water will kill the borers. I have washed mine this year, and know that it has not killed them. But it has blistered my trees and made them look badly, if it has not injured them. He may say that the water was too strong, but I followed his directions, viz.: one pound to a pailful of water.

PRINCETON, September 24, 1855.

Statement of Enoch Caldwell.

The orchard entered by me for premium contains about one hundred trees, which were set out in the autumn of 1845, in a dry, but loamy soil, twenty-two feet apart each way, the holes being four feet across at the top, and one and a half deep, care being taken to place the roots in the same position as before removal.

The land, which contains about one and one-fourth acres, has received annually about twenty loads of barnyard manure, with the addition of eight or ten bushels of unleached ashes —has been cultivated most of the time—two years it was down to grass and mown twice each year, and the third year, observing that the trees did not grow as well as usual, it was ploughed, and has since been cultivated.

The trees have been washed once, and sometimes twice, in a year, in May and in July or August, with a solution of potash, in the proportion of one pound of potash to one and a half gallons of water, which I think is as strong as the bark of young trees will bear.

FITCHBURG, September, 1855.

HAMPSHIRE.

From the Report of the Committee.

The culture of fruit trees may be a source of *profit*. There is no other pursuit connected with the farm, requiring so little labor and expense, that is so lucrative. There is a great income in proportion to the outlay. No crops of grain, grass, or esculent roots, other things being equal, pay so well as the fruit crop. Many farmers annually get more profit from their orchards, and receive more money for fruit, than for all the other products of the farm. One of my neighbors has gathered and sold from one tree, this season, thirty bushels of fine fruit. An orchard of forty Baldwin apple trees "has been known to produce, in one season, three hundred bushels of fine fruit." Says H. F. French, "At the lowest rate of product that any man in his senses would estimate, as a common crop, an apple orchard will give four times the amount of profit, as the same quantity of land in grass for hay, with less cost for cultivation."

Apples are in good repute for fattening horses, cattle and swine.

Cider vinegar is the nicest and most agreeable of any, and readily brings from three to five dollars in market. Cider molasses, made by boiling sweet cider into a syrup, is excellent for making and preserving sauces. Brandy, distilled from fermented cider, for certain useful purposes, is not excelled by any other spirit.

Pleasure, luxury, health and profit are, or ought to be, powerful incentives, to every one who owns an acre of land, to raise fruit trees. A farm without an orchard is like a book without title-page or pictures; or a painting destitute of the proper light and shade; or a heaven without stars.

Your committee were invited to view six orchards and two nurseries. Five of these have been set out since 1845; the sixth was an old orchard, reclaimed by the process of grafting. Three of these orchards have already received first premiums from other incorporated societies, and consequently could not again receive a first premium, under the statute of 1855.

All the orchards we examined were in good condition, and looked beautifully.

Orchard of Moses Stebbins.

This orchard was undoubtedly the best orchard, and would have taken the first premium, had it not already drawn that premium from another society, receiving the bounty of the State. His orchard stands upon table land in Deerfield, just under the brow of Sugar Loaf Mountain, and covers over four acres. It contains two hundred trees, set out at intervals since 1845. The soil is a light, sandy loam, partaking much of the nature of the soil in the vicinity of Sugar Loaf, which is composed of new red sandstone. Previous to setting out his trees, Mr. Stebbins treated his lot to a compost of slacked lime and salt. On two acres, he ploughed in sixty hundred pounds of lime, sixteen bushels of salt, and six bushels of plaster. One hundred and twenty trees stand on these two acres. The land has been cropped annually. This year, Mr. Stebbins has raised fifty bushels of corn to the acre, in his orchard. He used no manure, save about five hundred pounds of guano to the acre, sowed on and ploughed in. Your committee thought the lime and salt had much to do with the thriftiness of both trees and corn. He gives his trees a top-dressing of compost every spring. Mr. Stebbins does not allow any thing to grow under his trees. He leaves a fallow plot under each tree. His orchard contains the choicest varieties of fruit. We congratulate Mr. Stebbins on possessing so fine an orchard. Your committee left, hardly knowing which to admire most, Mr. Stebbins, himself, as an accomplished and gentlemanly farmer, his superior orchard, or his model farm. We advise every person, who wants to raise an orchard, to visit his premises.

David Rice, *Chairman.*

Statement of Josiah Ayres.

Apple seed should be planted in the fall, in land well manured and deep tilled. When the shoots come up in the spring, cultivate with care, stripping off the leaves one foot from the ground. When one year old, transplant them in rows, at a proper distance. As soon as large enough, bud them near the ground, with buds taken from good bearing

trees. When large enough to transplant, prepare holes, at least four feet in diameter, and three feet deep; two feet thereof thoroughly mix with compost, then transplant with great care. Set the trees about the same depth that they stood in the nursery, two rods each way; never set a tree that is not thrifty; mulching is good. Manure them in the fall with compost; dig it in, in the spring, when the apple-trees are in blossom, and put ashes and charcoal around the trees: this is the best time to prune and wash the trees. Great care should be taken not to prune too much in this climate. The limbs and trunk should be shaded, when the tree is growing fast, in August and September. When the tree is small, let it be shaded artificially. Let the twigs grow on the limbs when the tree is too small to bear fruit. It will not injure the tree so much as when fruit grows on the ends of the limbs. Wash trees in ley, potash-water, or soda-water, which you please; but take great care not to have the wash too strong. The strength can be determined by observation: if too strong, the bark will soon turn dark, and when it is wet with rain it will turn yellow. The wash should not turn the color from the natural green.

Select what fruit you please for your own use; but for profit select such as grow quick and bear well, and are wanted in market, especially such as are adapted to this climate.

NORFOLK.

Statement of Henry Goulding.

The apple orchard which I offer for premium contains one hundred and twenty-three trees; ninety-one were set out in 1851 and 1852, except a few, that have died and been dug up, others having been set in their places. I set the trees thirty feet apart, with a row of peach trees between them each way. I have raised corn and potatoes every year since the trees were set out. I manured in the hill, putting two shovelfuls to each tree when planting. The trees are Baldwins, Greenings, Hubbardston Nonesuch, and Porters.

The fruit that grew on twelve other trees, offered for premium in 1855, is as follows:—

Hubbardston Nonesuch.

No. 1,	Grafted	1847,	Yielded	35½	bushels,	10	barrels	market	apples.
2,	"	1847,	"	19	"	5½	"	"	"
3,	"	1848,	"	15½	"	5	"	"	"
4,	"	1850,	"	8½	"	3	"	"	"
5,	"	1851,	"	7½	"	2½	"	"	"

Baldwin.

No. 1,	Grafted	1848,	Yielded	18	bushels,	5½	barrels	market	apples.
2,	"	1848,	"	17	"	5	"	"	"
3,	"	1850,	"	18½	"	3	"	"	"

Porter.

No. 1,	Grafted	1847,	Yielded	15	bushels,	4½	barrels	market	apples.
2,	"	1846,	"	14	"	4	"	"	"
3,	"	1847,	"	17½	"	5	"	"	"
4,	"	1847,	"	14	"	4	"	"	"

Dover, October 25, 1855.

PLYMOUTH.

Statement of Horace Collamore.

Some years since, the Trustees of the Plymouth County Agricultural Society offered prospective premiums "for the most extensive and valuable orchard of peach trees," payable in 1855. As a competitor for these premiums, I will state, that prior to 1847 I had met with very indifferent success in the cultivation of peach trees, so universal and fatal were the depredations of the borer.

Having tried some experiments with ashes, (the remedy confidently recommended in 1847–8,) I purchased some fifty trees. I also purchased in Boston a peck of peach-stones, which were carefully cracked, the meat taken out and planted, and cultivated in the same manner as Indian corn; the seed germinated well, and supplied me with a sufficient number of trees to transplant two other orchards, comprising in all two hundred and seventy-five trees now in bearing condition, viz.: one hundred and thirteen in my original orchard, in front of my dwelling; one hundred northerly of the same, and fifty-seven on the hill back of the same. The soil on the first is a sandy loam, in good condition; the second is on a side hill facing the west—a poor sandy soil; the last, on the hill, is a hard gravelly soil. The first few years we planted the land between the rows with corn, beans, &c., manuring with mud compost and ashes.

The rapid growth of the trees caused us to abandon cultivation in 1851–2, when the first orchard was mulched with trash washed from the meadows to the margin of the upland; the second was dressed with twenty bushels of ashes, sown broadcast; the other trees, being farther apart, have received a yearly dressing, and crops have been raised between them. In the spring, we annually apply about half a peck of ashes immediately around the trunk of each tree, taking care that it makes a ridge completely around the same; this forms a barrier over or through which the borer seldom or never attempts an ingress into the tree.

This is the panacea to which I attribute my success in raising peach trees. Since applying ashes in this manner, I have not lost half a dozen trees from any cause. As to the cause and cure of other diseases which the peach tree is "heir to," I believe nothing definite is known. The curled leaf happens periodically, causing many trees to shed their foliage prematurely, which, undoubtedly, retards their growth and lessens their productiveness. The yellows seldom affect trees in this vicinity; and I am not certain that I ever lost a tree by this disease—certainly not more than one.

The borer is undoubtedly the worst enemy that the cultivator of the peach tree has to contend with; but the application of ashes, as before described, has, for eight or ten years, proved with me a successful remedy. Whether this periodical application has also prevented a more extensive spread of the "yellows," I am unable to state; but it is not at all improbable. Our long, cold northern winters, and late, backward springs, are serious obstacles to the successful cultivation of the peach in this county.

The severity of the last winter not only destroyed the crop, but essentially injured the trees, in most locations. Our crop of peaches in 1853–4 probably averaged two hundred bushels, whilst that of the present season was less than ten bushels; but the trees have, in a great measure, recovered from the shock, and exhibited (in the latter part of the season) encouraging signs of youthful vigor.

Of the two hundred and seventy-five trees raised by me, about fifty were inoculated, and consist of Early York, Early Rose, Oldmixon Freestone, Golden Rareripe, Stump the World,

Crawford, and Melacotons. Those planted and raised from the seed were not inoculated, and are of every conceivable variety, and in excellent proportion, from the Allen, Hatch, Early Rareripes, Yellow Rareripes, and Willow, to the intermediate and late kinds.

On young trees, for several successive years, we have practised the shortening-in system, cutting off the extremity of each limb, about one-third of the last year's growth; and we cannot too strongly commend this practice, even on trees of an older growth.

Pembroke, 1855.

ORNAMENTAL TREES.

The cultivation of ornamental trees has not, as yet, received that encouragement from the Agricultural Societies which its importance demands. As one of the modes by which not only the farm, but the neighborhood, the town, and the whole county may be permanently improved and made attractive, it is worthy to receive the serious attention of those who have it in their power to give a strong stimulus in this direction, by the offer of generous premiums.

The legislature passed a general law in 1853, authorizing the incorporation of ornamental tree associations, in the following words, viz. :—

"Any ten or more persons in any county, town, or city, within the State, who shall, by agreement in writing, associate for the purpose of encouraging agriculture, horticulture, or improving and ornamenting the streets and public squares or any city or town, by planting and cultivating ornamental trees therein, may become a corporation by such name as they shall assume therefor, by calling their first meeting and being organized, in the manner provided in the forty-first chapter of the Revised Statutes for the incorporation of the proprietors of social libraries and lyceums; and every such association, upon becoming a corporation as aforesaid, shall have, during the pleasure of the legislature, all the like rights, powers and privileges

as the proprietors of such libraries; and may hold real and personal estate not exceeding ten thousand dollars."

Associations were formed in some towns and villages, in accordance with the provisions of this act, and many thousand dollars have been added to the value of real estate, wherever their efforts have been judiciously directed.

The sections of the forty-first chapter of the Revised Statutes, referred to in the above act, read as follows, and indicate the method of calling the first meeting and organizing. But little formality is necessary, and enterprising individuals need not delay from ignorance of the mode of proceeding.

"SECT. 1. Any seven or more proprietors of a library may form themselves into a corporation, under such corporate name as they shall adopt, for the purpose of preserving, enlarging, and using such library; and for that purpose, any justice of the peace may, on the application of five or more of such proprietors, issue his warrant to one of them, directing him to call a meeting of the proprietors, at the time and place and for the purposes expressed in the warrant; and said meeting shall be called by posting up the substance of the warrant in some public place, in the town where the said library is kept, seven days, at least, before the time of meeting.

"SECT. 2. Any seven or more of the proprietors of such library, met in pursuance of such notice, may choose a president, a clerk, who shall be sworn to the faithful discharge of his duty, a librarian, collector, treasurer, and such other officers as they may find necessary; and they may also determine upon the mode of calling future meetings."

Would it not be well for the county agricultural societies to encourage the formation of associations under the law of 1853, and also to encourage individuals to set out and take care of ornamental trees? It would, at least, attract attention to the importance of cultivating a taste for the beautiful, and would, in a few years, make many a place attractive and agreeable, which is now uninteresting, if not, indeed, positively forbidding. He who plants and tends a tree, raises a monument which may survive him a hundred years; and the society which encourages him in it, will at least perpetuate its influence by the permanent improvement of land, thus adding greatly to the aggregate wealth and prosperity of the State.—ED.

NORFOLK.

Statement of Cheever Newhall.

By the publications of our society I have learned that the subject of encouraging the planting of forest trees has engaged the attention of its members from its formation; that in the year 1852, the very liberal premiums of thirty and twenty dollars were offered to any *city* or *town* in the county, for the largest number and best growth of ornamental trees, which shall be planted in any public square, or on the road-side. Subsequently a premium of ten dollars was offered to the *individual* who should plant in like manner the largest number. No application, I understand, has hitherto been made for either premium.

I respectfully request the trustees to examine those I have planted on the road-side for shade and ornament, part of them bordering my own lands, and part in front of the lands of others, in the immediate vicinity; they are mostly from two to three rods apart, and are all in a thrifty condition, in number and variety as follows:—

134 elm,	3 tulip,
63 ash,	2 mulberry,
50 maple,	1 poplar,
5 three-thorned acacia,	1 oak,
3 horse chestnut,	1 beech.
Total, ...	263

When it is considered that a beautiful tree, overarching the road-side or bordering some broad avenue, where it can grow and develop itself on all sides, is one of the finest pictures of symmetry and proportion that the eye can anywhere meet with, I am astonished at the indifference and neglect prevailing in nearly every part of the country.

Should this communication have even a remote tendency to awaken in the county an interest in the subject, my object in making it will be attained.

Dorchester, November 10, 1855.

FOREST TREES.

HAMPSHIRE.

From the Report of the Committee.

It is well known that many countries, which were formerly well watered and populous, as portions of Egypt, Syria and Persia, have, by the destruction of the forests, been converted into treeless, arid, uninhabitable wastes. The same change is rapidly coming over our own land, and, unless arrested soon, will produce equally disastrous effects.

Forests are useful in many ways; they furnish fuel and timber; they absorb carbonic acid, and purify the atmosphere by evolving in its place an equal amount of oxygen; they attract electricity and rain from the clouds, and by their shade prevent the too rapid evaporation of water from the earth; and they exert a wonderful power in decomposing rock, loosening and deepening the soil and supplying it with a vast amount of vegetable matter.

Did the space allotted to this report permit, it would be interesting to consider at length the question, whether the members of the society could not profitably transform one-half, or, at least, one-third of their over-large farms into plantations of valuable trees. Would it not pay better to have a plantation of healthy pines growing rapidly every year, and at the same time benefiting the soil, beautifying the landscape, and purifying the air, rather than to own a barren, sun-burnt, old field, which will yield ten bushels of rye per acre, once in three years? Would it not be well to have fine forests of European larch at work, decomposing the granite rocks of the hill pastures, and at the same time, protecting the thin turf and cattle from the scorching rays of the sun, and breaking the furious wintry blasts which are ever stripping off the snowy covering, so kindly furnished to keep out the cold; and, in addition to all this, attracting every neighboring thunder cloud, disarming it of its deadly power, and absorbing its life-giving electricity and its refreshing waters, and receiving from every passing breeze its poisonous carbonic acid to be converted into carbon

for valuable timber and wood, and oxygen for the support of man and the animal kingdom? Would it not be well to inquire whether white oak, white ash, locust, black walnut or hickory could not be advantageously planted on some of the better soils; or, whether every man may not as well have an orchard of sugar maples as one of apple trees?

These suggestions are thrown out, in the hope that the members of the society may be persuaded, at least, to think of the subjects thus briefly hinted at, to be cautious in the use of the axe, and to entertain a suitable reverence and affection for the noble old trees, which are ever toiling silently but faithfully for their welfare.

Plantation of T. P. Huntington.

This plantation is beautifully situated in Hadley, on a low range of hills, running parallel to the Connecticut River, and is elevated some sixty feet above it. It comprises four acres of light sandy soil, and was planted twenty-five years ago. Furrows, one rod apart, were ploughed across the lot, and one thousand locusts were set out in them. At present, the piece is covered with a dense growth of white and yellow pine, with occasionally an oak, a hickory and a chestnut. Many of the locusts have died, so that not more than half the original number remain. These are from fifteen to thirty feet in height, and are as thrifty as could be expected on such a soil. They are not very badly affected by that scourge of the locust tribe, the borers, although nearly every tree bears their mark.

WILLIAM S. CLARK, *Chairman.*

HEDGES.

NORFOLK.

From the Report of the Committee.

Your committee, last year, dwelt at some length on the beauty and advantages of hedges, composed of different materials, and they will now only express the wish that they may be extensively cultivated, both for ornament and use. It is well

to bestow some thought on the embellishment of grounds, thus opening new sources of pleasure of a pure, tranquil, and elevating character. Let the air, if possible, come to us loaded with fragrance; and, while we inhale its invigorating draughts, let the eye rest on colors and forms of beauty, exhibiting all the delicate pencillings of light and shade which mark the seasons and hours, and the perpetually occurring changes in the surrounding atmosphere.

Last winter, in this vicinity, proved somewhat unfriendly to hedges, particularly the arbor vitæ. It is singular that a plant which is indigenous so far north—which is found in perfection in the forests of New Hampshire and Maine—should not be hardy enough to bide the severity of our winters. But some of our winter or spring winds, the latter especially, as observation teaches, prove terribly blighting, even to trees which are native to our soil, particularly such as stand on the borders of woods, or where they are exposed to strong currents and receive the full force of the sweeping blast. Both the pine and the common red cedar, hardy as they are esteemed, frequently suffer, exhibiting in spring a blighted appearance, though occupying their natural position. Transplanted trees are more likely to suffer in this way, because generally more exposed. The arbor vitæ, though taken from a more northern latitude, is, when standing alone, unprotected by other trees, peculiarly subject to injury among us, from the blighting winds referred to. Many were lost last winter or in early spring. In a compact hedge they are less subject to injury from the above mentioned cause, though, for some reason not fully explained, a peculiar blight, last winter, fell partially on hedges —confined in some instances to a single plant, in others extending to several in succession. Some of these plants afterwards recovered, while others, though seemingly possessing life at the root, lost all appearance of vitality above the surface of the ground, thus producing ugly gaps. The only remedy seemed to be to remove the blighted plants and substitute others. In two or three years, it is supposed, the beauty and uniformity of the hedge may be thus restored. This peculiar blight, however, is rare; we have no account of its previous occurrence, and the experience of last winter even, does not

destroy our general confidence in the value of the arbor vitæ as a material for hedges.

The arbor vitæ hedge, entered for premium this year, belongs to Horatio Chickering, Esq., on East Street, Dedham, and has from the first been under the care of Mr. Robert Watt, who, at the recommendation of the committee, last year received the diploma of the Society for his peculiar skill and taste in the arrangement of hedges. It consists of two parts: one of seven hundred and fifty-seven feet, planted by Mr. Watt in 1851, four years ago last spring; the other of six hundred and seventy-two feet, planted in 1853, two years ago,—in all one thousand four hundred and twenty-nine feet. The plants were brought directly from the woods of Maine, and were set in the hedge without having had the benefit of nursery planting. The result has proved entirely satisfactory. Few, if any, plants have been lost, though for the space of a rod, or perhaps half a rod, near one of the buildings, the effect of a strong current of wind is visible. The part of the hedge which has been longest set—that bordering on East and Walnut Streets—is now about two or two and a half feet in height, perfectly wedge-shaped, and exhibits a beautiful and uniform appearance. It is protected from depredation or injury on the side next the street by a light, open fence, which is needful, where a hedge of this material is planted at level on the borders of a highway.

EBEN WIGHT, *Chairman.*

DEDHAM, Oct. 17, 1855.

PLOUGHING.

ESSEX.

From the Report of the Committee.

We find that there is much difference in opinion among practical men in regard to the Michigan plough; some speak in the highest terms of it, while others, who have tried it, condemn it altogether. Upon one point we have a uniform testi-

mony from all parts of the county: all agree that the labor in cultivating a crop upon tough grass land, that has been ploughed with the Michigan plough, is much more than it is where the common plough is used.

The reason of this is obvious to any one who will notice the operation. He will see that the grass roots are nearer the surface, and in a more favorable situation to vegetate than they are when the common plough is used.

Common sense, as well as chemistry, applied to agriculture, will teach us that in ploughing grass land we want a plough that will place the grass roots where they will soonest decompose. If the mechanical effect of the double plough is better for pulverizing the soil than the single one, and the chemical influence is not so favorable, we had better use the single plough.

On a stiff soil, where there is but little vegetable matter, we think the double plough may be advantageously used. But our impression is that the plough manufacturers have increased *their* harvest by its use more than the farmers have theirs.

The land upon which the ploughing match took place was a rocky loam, better suited to try the strength of the plough and the patience of the ploughman, than to exhibit the speed of the team. The soil, where the rocks did not obstruct the plough, was stirred nine inches deep.

Wm. R. Putnam, *Chairman.*

In regard to the depth of ploughing, the doctrine taught by most of the societies, strange as it may seem, has been that shallow ploughing is best; and the premiums have been awarded for ploughing from five to seven inches deep with single teams, and from seven to nine with double. These depths may be sufficient under some circumstances; but the inconsistency was in constantly praising deep ploughing, while offering and awarding premiums for shallow. The highest premiums, at least, should, it is thought, be offered for deep ploughing, since there is comparatively little skill required to plow otherwise, nor is the draught of the plough so thoroughly tested.

NORFOLK.

From the Report of the Committee.

Your committee add, that it affords them no small satisfaction to witness the interest manifested in the "Ploughing Match." They consider this as an indication of the interest felt by the public on this subject—as an indication of the growing conviction, in the community at large, of the great benefits resulting from deep and thorough ploughing. It is extremely desirable that every farmer should understand how much both the *quality* and *quantity* of crops are affected by rightly preparing the soil for the reception of the seed. When it is considered, for example, that, instead of twenty or thirty bushels of corn to the acre, as was the common crop under the former method of shallow ploughing, there can be raised upon the same ground, under the present improved mode of cultivation, forty, sixty, eighty, and, in some cases, even an hundred bushels to the acre, the great advantage of the latter method must be apparent to every candid and reflecting mind; and, although all do not adopt it, it is, nevertheless, a pleasing consideration, that the number of those who do adopt it is increasing.

The former Lieutenant-Governor Robbins, on a public occasion, remarked, "that it was the work of an age to *establish* a *principle*." It is the work of an age to introduce and establish a new principle and practice in agriculture. We are now doing such a work. Our society, by its public exhibitions, by its annual reports, and in various other ways, is affording essential aid toward the accomplishment of this important object.

RALPH SANGER, *Chairman.*

SUBSOIL PLOUGHING.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of George Dickinson.

I have used the subsoil plough for an acre or two a number of times; but until this season I have never taken pains, by measuring the land and the products, to ascertain accurately whether there was a decided benefit in using it.

Lot No. 1 was a part of my home lot, planted to Indian corn. The first plough was run about nine inches deep, and the subsoil about five inches. As this was near my house, I examined it carefully all through the season, but could perceive no difference between this and other parts of the field. In harvesting I could not very well keep this separate, and did not measure it by itself.

Lot No. 2 was part of a meadow lot planted to Indian corn. This lot is about one hundred rods long and twenty-four rows wide. Eight rows were subsoiled, and otherwise all were treated alike. At harvesting, each eight rows were stacked by themselves and measured separately, and the product was as follows:—

The east row gave	$51\frac{51}{56}$	bushels.
Middle row gave	$48\frac{51}{56}$	"
West row, subsoiled, gave	$57\frac{38}{56}$	"

This part of the lot has not been considered so good as the remainder, so that, if there is no mistake in measuring the corn, there was a decided benefit resulting from the use of the subsoil plough.

Lot No. 3, containing two acres, was planted to broom corn; the west side was subsoiled, otherwise both sides were treated very nearly alike.

The yield on this half was 723 lbs.; the yield on the other half was 781 lbs. But here I am somewhat thwarted in making a fair experiment. The last lot was housed in good order, while the other half was out in a storm, which would diminish the weight very much. It is my opinion that the crop was not benefited by the subsoiling.

HAMPSHIRE.

Report of the Committee.

Notwithstanding the great importance, not to say the *absolute* necessity of deep tillage on certain soils, to insure an abundant and paying crop, yet few seem disposed *practically* to believe it. They readily admit the theory, but, for some unaccountable reason, they are slow to practise. We venture to say, that it is impossible to reclaim, and make productive, any land, high or low, marshy or otherwise, which has a hard, clayey subsoil, without *deep tillage*. This is absolutely essential on land of this kind, if a paying crop is to be obtained; for, in no other way, oftentimes, can the surface water be successfully drained off. In almost all cases, the subsoil plow will drain the land more effectually than either blind or open ditches. Let this plough follow the common one, loosening the earth as far below the first furrow as that furrow is deep, and the entire field thus ploughed is underdrained; the water contained in the surface soil being received by the loosened subsoil below, and, being retained there, furnishes moisture for the growing crop in time of drought. Experience has demonstrated that, on soils of the kind under consideration, all crops and grasses are much benefited by subsoiling. The roots of crops go *down* for sustenance and moisture, as well as search for them on every side. We cannot too strongly urge upon our brother farmers the use of this plough, especially on hard soils. Use it for spring crops, use it for winter grain, and use it if you would have good meadows.

S. C. WILDER, *Chairman.*

Experiments of Albert Montague.

I present for consideration a statement of the effect of subsoil ploughing upon three pieces of land of similar soil, and in about the same state of cultivation. I ploughed the land seven to eight inches deep and subsoiled six to seven inches.

No. 1 was a piece upon which a crop of corn was taken last year. It contained one acre. One half of it was subsoiled. The whole piece had been equally manured, and treated alike

CORA.

Hereford heifer one year old owned by the State.

See Preface.

for a number of years. Upon this piece I sowed oats and grass seed, and could see no difference in the piece from the time the oats came up until harvested. But now, the clover upon the subsoiled part is a little the largest, enough to be noticed by persons who pass by the lot.

No. 2 was a piece of greensward, containing two acres. One-half or three-fourths of an acre, through the centre was subsoiled. Upon the whole I spread compost manure and harrowed it in. I spread as evenly as I could over the whole piece; then planted it to broomcorn, using a few ashes in the hill. The piece was cultivated alike through the season; but the broomcorn upon the part subsoiled was longer, of a better color through the season, and, I judge, will yield from one hundred and fifty to two hundred pounds of brush to the acre more than that upon each side of it, and the seed is much better.

No. 3 was a piece subsoiled three years since, and planted to corn. The same quantity of manure was used, and it was managed alike through the season, and the corn crop was no better upon the subsoil than upon the part not subsoiled. I sowed grass seed at the last hoeing. I have mown it for two years past, and each crop of grass has been much the best upon the part subsoiled, being, I think, nearly a ton more to the acre.

SUNDERLAND, Oct. 10, 1855.

SPADING.

NORFOLK.

From the Report of the Committee.

The spading match has become one of the most interesting features of our exhibition, whilst the great improvement manifested in this department shows that our farmers have profited by the lessons of previous years, and are fully aware of its importance.

It would be useless, here, to repeat the benefits of thorough spading; but it may be of advantage to state the plan on which your committee made their decisions.

It is difficult to convince competitors that time is not the main

point; and although there was a decided improvement in this respect over previous years, yet there is room for still more.

Not only *time*, but the *depth*, *fineness of pulverization*, and *general finish* presented by each lot at the conclusion of the work, are to be taken into account.

On the outside, at the head of each lot, a stake was driven, with a number marked on it plainly, and the men then drew for the choice of numbers.

Each lot contained one hundred square feet, and before commencing, it was distinctly cut round and marked out.

The shortest time occupied in performing the work was sixteen minutes, and the longest twenty-four. The recipient of the first premium did not perform his work in the shortest time, but excelled in the above mentioned requisites of good spading.

A. D. Weld, *Chairman.*

MANURES.

WORCESTER NORTH.

Statement of Jabez Fisher.

My experiment in the application of manures was conducted as follows: I divided $1\frac{1}{4}$ acres of ground, consisting of a moderately strong loam upon a clay bottom, into five equal parts. Except in the matter of manures all parts of the field were treated precisely alike. The compost mentioned in the table was made from four parts of the clear droppings, solid and liquid, of the barn, with one part of wool waste. This was ploughed in. The guano and plaster were mixed, sown broadcast, and, as were also the phosphates, worked in with the cultivator. Long orange carrot seed, $2\frac{1}{2}$ lbs. to the acre, was sown May 26, in drills seventeen inches apart. The seed vegetating very unsatisfactorily, the whole piece was resown in the same drills, June 13. The plants came up very thinly, looked small all the season, and ceased growing about the middle of September. This deficiency in growth I am at a loss to account for, unless it is to be attributed to the quality of the seed, for the reason that upon a part

of the same ground I raised carrots at the rate of nearly 1,000 bushels to the acre, last year, when the season was less propitious than this. The seed was purchased both years, but from different sources. The value of the experiment is not interfered with by this small yield, except in this, that had the carrots grown through the entire season, I am inclined to the belief that that portion manured with the compost would have increased in a greater ratio than the others. The ground was hoed twice, and the crop harvested Oct. 30. Total average cost of production, including interest on the land and taxes, fifteen cents per bushel.

Lot.	*Manure.*	*Cost per acre.*	*Product per acre.*
No. 1.	DeBurg's No. 1 super-phosphate of lime, ...	$12 50	395 bushels.
" 2.	Mapes' nitrogenized super-phosphate of lime, . . .	12 50	366 "
" 3.	Mapes' improved do., .	12 50	350 "
" 4.	Guano and plaster, equal weights,	12 50	339 "
" 5.	6 loads compost, . .	48 00	294 "

Statement of B. Safford.

The piece of land on which I tried my experiments was broken up in the fall of 1853, and in the spring of '54 a part of it was planted with potatoes, with a little guano, plaster and hen manure; the remainder was sown with oats without any manure. Last spring I spread on a very small coat of green manure and ploughed it in: I then harrowed and furrowed it ready for planting. I commenced planting on the end that was planted with potatoes last year. The kind of corn I planted is the Tuscan, or smutty white.

Lot.	*Manure.*	*Product of ten hills.*
No. 1.	DeBurg's super-phosphate of lime,	$10\frac{3}{4}$ lbs. of ears.
" 2.	Two parts muck, one part dove manure,	$13\frac{3}{4}$ " "
" 3.	Muck and hen manure, in same proportion, ...	$11\frac{3}{4}$ " "
" 4.	Night soil, muck and loam, about four to one, ...	$12\frac{1}{2}$ " "

No. 5. Hog manure,	. . . .	14¼ lbs.	of ears.
" 6. Bones, ashes, loam and urine,	.	13¾ "	"
" 7. Guano,	. . 31 stalks 49 ears,	21¼ "	"

Nos. 1, 2, 3, and 7, had one table spoonful to the hill. Thirty hills to the square rod.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of J. E. Porter.

The land is situated upon the plain, too far from home to receive benefit from the barnyard. It is a sandy loam, having been frequently cropped with rye, the crop of 1854 being about five bushels per acre. Some four years ago, wishing to try the effects of the wonder-working guano upon this land, I purchased, and having carefully composted with seven parts of earth, I applied it to the hill at the rate of 100 lbs. per acre, and planted to corn. At the first hoeing I was greatly surprised at the healthy appearance of the crop; and it continued to grow vigorously, outstripping, for a few weeks, the corn upon my best land. My expectations were greatly raised, and I thought, surely this guano is a *wonderful thing*. But at earing time a change had come over my field of corn. It had assumed a sickly appearance, and I found the guano, in its haste to produce stalks, had expended all its force, and there was nothing left for ears. My crop was a failure. I came to the conclusion that if I had treated my poor starved land more liberally with guano, I should have been amply repaid at harvest time. I have practised since on this plan, and have had my reward.

The field of corn contains about five acres. Near one end of the field is a muck swamp, from which I hauled and applied muck, at the rate of about ten loads per acre. This was spread over the surface, and four hundred pounds of guano per acre sown broadcast, and the whole ploughed under to the depth of six inches. At harvest time I measured from the field three acres, and give you the result:—

Ploughing, three acres, ...	$6 00
Planting with machine, $1.50; rolling, $1, .	2 50
Seed corn, $1; hoeing, twice, $6, . .	7 00

400 lbs. guano per acre, ...	$36 00	
Drawing and spreading muck, . . .	6 00	
Interest on land, at $25 per acre, . .	4 50	
		$62 00
Product, 306 bushels ears, equal to 153 bushels shelled corn, at $1, ...		153 00
Profit, ...		$91 00

The fodder and soft corn will pay the expense of harvesting.

HAMPSHIRE.

Statement of Albert Montague.

No. 1. I purchased, last spring, super-phosphate, poudrette and guano, for the purpose of testing their comparative value with each other and with barnyard manure.

Upon one acre of my best land I spread eight loads of well rotted manure, and harrowed in; then planted to broomcorn, using $1.44 worth of poudrette in the hill, upon one half of it, and $2.41 worth of super-phosphate upon the other half, dropping both poudrette and super-phosphate at the time of planting, using Woodward's planter. At the first and second hoeings, the corn where I used the super-phosphate was the most promising, and at harvesting, I should judge, would yield from fifty to one hundred pounds more broom-brush.

No. 2. Upon a piece of greensward, soil rather cold and heavy, I spread fifteen loads of compost to the acre; then planted to Indian corn, using super-phosphate upon one half, and good wood ashes upon the other half, putting quantities of equal value upon each. The corn upon the super-phosphate part came up first, grew the fastest, ripened ten days earlier, and will yield ten bushels of corn more than the ashed part. Nearly the same result I found by experimenting with super-phosphate and ashes upon a piece of light, sandy soil. I think the relative difference was about the same, although the piece of corn was much lighter.

No. 3 was with guano and barnyard manure. I measured one and a half acres of good meadow land that had been well manured and well cultivated for a long time. Upon one half of it, I spread and ploughed in eight loads of good yard ma-

nure, for which I paid eight dollars. On the other half, being in the centre of the piece, I spread guano, at the same cost as the yard manure, (i. e. at the first cost—the expense of applying the guano was but little, compared with that of applying the yard manure). I harrowed in the guano. Then I planted to broomcorn, using a little super-phosphate in the hill upon the whole. The piece was managed alike, during the whole season, after the different manures were applied. Many persons who have passed, have asked why the middle of this piece looked so much the best. I referred them to the guano. The crop is not yet harvested, but good judges have said there would be two hundred pounds more of broom-brush and a greater excess of seed upon the guanoed half.

No. 4. Believing broomcorn stalks of some value, if ploughed in green, I cut some stalks from a part of a piece, immediately after I had taken off the crop, and placed the stalks in furrows nice and smooth—one hand ploughing while another took care of the stalks. I sowed the piece to oats, the following spring, and upon the part where I ploughed in stalks the oats were one-third heavier than where none were ploughed in. I obtained eight dollars worth of oats on one acre for the labor of getting rid of my broomcorn stalks in this way. And as to removing the stalks, it did not cost me a dollar more than to have gathered and burned them in the spring.

SUNDERLAND, Oct. 5, 1855.

PLYMOUTH.

Statement of Austin J. Roberts.

The plan adopted by me in making compost manure is as follows: As soon as our barn cellar and hog sties are cleared of manure in the spring, we commence carting in muck one year old, on which the droppings of some ten head of cattle and three horses are evenly scattered from time to time. I usually add two loads of decomposed muck to one of clear manure, but never more than this, for with a greater quantity you get a poorer article. With the usual number of cattle and horses, together with two or three pigs, I can make 250 loads of extra quality manure in my barn cellar and hog sties. Resorting to that

never-failing source of treasure—the farmer's mine—commonly called muck, peat, or mud, I compost it with unleached ashes, or lime slacked with brine, when it is deemed necessary to increase the bulk of the compost heaps, and when it can be conveniently obtained. The wash, ley and suds of the house, are saved from week to week, in barrels, and thrown on the muck, which is, by the way, an excellent absorbent. As I find it next to impossible to ferment our manure in the cellars, it is hauled out in large heaps in the barnyard or fields, early in March, for commingling together the horse, cattle and pig manure, and pulverizing the lumps, as well as fermenting slightly the whole. I have for some time past found great benefit in the use of oil meal fed to cattle. While its alimentary properties are equal to those of Indian meal, its chief value consists in doubling the value of the excrements of cattle, a fact which ought not to be lost sight of by our Old Colony farmers; it also possesses the property of protecting cattle from ever being troubled with lice while fed with it.

I have made and applied during the season, up to the present time, in my barn cellars, 248 loads of valuable compost manure, of forty cubic feet per load.

INDIAN CORN.

ESSEX.

Statement of James Day.

The piece contains $2\frac{1}{2}$ acres, of light, sandy interval, on the Merrimack River, and had been neglected until it produced only about nine or ten bushels of winter rye per acre, once in two years; in the intermediate years running to golden rod, &c.

In 1854 it was ploughed in the month of May, and again in October. Last spring it was ploughed crossways with a Michigan plough, deep into the subsoil, and sixteen cords of compost manure were spread upon *one-half of the piece*, made as follows, namely: three cords of summer dung, and about *the bulk of two tons of hay* of dried potato vines and weeds, four casks of

lime, $13 worth of Peruvian guano, together with a quantity of damaged meat and fish, were mixed up with soil sufficient to make the sixteen cords. Upon the other half thirteen cords of barn manure were spread, and the whole was well covered and mixed, by drawing over it a large cultivator and then harrowing it both ways, after which it was rolled. It was planted on the 13th of May, in hills three feet nine inches apart, with Mr. Porter's early, or Canada corn. It was hoed three times, a cultivator being used at the two first hoeings, and by the 20th September it was sufficiently ripe to harvest; but, for want of time, it was not harvested until last week.

The yield was ninety bushels per acre.

HAVERHILL, Nov. 14, 1855.

WORCESTER NORTH.

From the Report of the Committee.

It cannot be said of Indian corn, as of wheat, that it is an uncertain crop, for with good cultivation we are sure, nineteen out of twenty years, of a bountiful harvest. On this grain the farmer mainly depends to fatten his beef and pork, and to give strength to his animals for labor; and what could the farmer himself do without a good supply of Indian bread and pudding to give him strength for the labor of the farm? It is often said that we cannot raise corn on our rough farms for less than one dollar per bushel, which we think is not true. The average cost of corn offered in this society for premium this year, is not far from fifty cents per bushel, and we think that, with the use of labor-saving implements and a bountiful application of manure, it can be raised at from fifty to seventy-five cents per bushel generally, which, at the present prices, leaves a good profit for its cultivation.

JOSEPH UPTON, *Chairman.*

Statement of W. G. Wyman.

The acre of corn which I offer for your examination is part of a field of three and one-fourth acres, which, in 1853, produced only 1,650 pounds of hay, it having been mown eight years pre-

viously. In the autumn of that year it was ploughed. The soil is mostly a light yellowish loam, rather stony. The field inclines very much to the east. In 1854 about one-half of it was planted with corn, manured with a compost manufactured out of doors, from the droppings of my cows and swine the summer previous, mixed with loam and weeds, together with the scrapings from under an old barn, three dollars worth of ashes, and six loads of stable manure, the whole mixed together in the spring, spread evenly and ploughed in. The remainder of the field was manured very lightly in the hill, and planted with potatoes and beans, but not ploughed at all.

Last spring the whole field was manured with about thirteen and one-half cords of compost, manufactured in my barn cellar, from the droppings of one horse, two cows, two calves, and three pigs, from the 10th of September, 1854, to April 1, 1855, mixed with loam, weeds, and meadow-muck, together with four cords manufactured in the field from the cleanings of the vault, three barrels of urine, four or five bushels of lime and ashes, in which some animal matter had been dissolved, mixed with two loads of hog manure, and ten loads of meadow muck, making in all about seventeen and one-half cords, say fifty-two loads, spread evenly and ploughed in with a side-hill plough, running from eight to eleven inches deep.

The field was harrowed once and marked one way with an instrument which made five marks at once, three feet apart, and on the 26th and 28th of May, three acres were planted with common yellow corn, using Randall & Jones' double corn planter, set three feet six inches wide, with which I crossed the marks, giving rows both ways. When the corn came up I put a handful of ashes on the hills, using forty-eight bushels. I planted it so deep that it did not come up well, and the worms and crows worked it badly. The deficient hills I supplied with beans and cabbages.

The corn was hoed twice by myself and two men, working one day each time. Previous to hoeing I ran through my horse hoe, once in a row each way, it requiring, both times, one day's work of myself, horse and boy, each way, or four days with a horse hoe.

I estimate the expense of cultivating the one acre as follows, viz. :—

Manure,	$16 00
Laying out and spreading the manure, 16 loads,	4 00
Laying out the ashes, 16 bushels,	2 67
Ploughing and harrowing,	3 50
Marking and planting,	33
Cultivating with the horse hoe,	2 50
Hoeing with the hand hoe, twice,	2 00
	$31 00

Statement of Jabez Fisher.

The acre of corn, which I enter for the society's premium, was planted upon a moderately strong loam, resting upon a clayey bottom. Its slope was toward the south and east. Cultivated last year for sweet and fodder corn. Ploughed twice during the third week in May, ten or twelve inches deep. Manured broad cast, previous to ploughing, with fourteen loads, containing four and a half cords of the following compost. Of the clear droppings, solid and liquid, of one horse and seven head of neat stock, four parts, wool waste, one part. Corn, of the improved King Philip variety, was sown, May 26, in drills, three feet eight inches apart; the stalks, at gathering, averaging seven and a half inches distant from each other in the row. Manured in the drill with hen manure, worked fine with loam. Hoed twice with the horse hoe, followed by the hand hoe. Culture entirely flat. Stalks were cut up whole, September 24, and stooked on the field. It was husked the last week in October, and yielded 6,640 lbs. of ears, or forty-one and a half pounds to the square rod. The whole amount of soft corn was less than a bushel, of which I make no account.

One acre of land, in account with Jabez Fisher,	*Cr.*
By $92\frac{2}{9}$ bushels, 72 lbs. each, of sound corn, at $\$1.12\frac{1}{2}$,	$103 75
" Fodder,	15 00
" Unexpended manure, $\frac{2}{5}$ of the whole,	14 00
	$132 75

Contra:—	*Dr.*
For interest and taxes,	$6 95
" Ploughing twice,	4 00
" Cultivating and furrowing,	1 00
" Compost manure,	27 00
" Hen manure,	8 00
" Carting and spreading,	3 00
" Planting and seed,	2 00
" First hoeing,	3 20
" Second hoeing,	3 20
" Cutting and stooking,	3 15
" Storing and husking,	9 00
" Balance, being net profit per acre,	62 25
	$132 75

Cost of production of corn per acre,	$41 50
" " per bushel of 72 lbs.	45
Profit per bushel,	67½

JABEZ FISHER.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of J. E. Porter, Hadley.

I offer for a premium the following crop, not supposing it to be a larger yield per acre than has been obtained by others. But, taking into account the situation and condition of the land, and the method of cultivation, the result has been entirely satisfactory to myself, and I am willing to compare notes with my brother farmers, and leave it to those who are competent to decide upon its merits.

The quantity of land upon which the crop was raised is two acres. The soil is a sandy loam. The land lies upon the plain, one mile east from my barn. In the summer of 1854, after taking from the land a crop of rye, say twelve bushels per acre, which crop followed a crop of broomcorn in 1853, of some 400 lbs. per acre, (I mention this to show the condition of the land,) I hauled from a muck hole near by, some sixty loads of material, which I deposited in four piles, placing a load of horse manure at the bottom and another in the middle of each pile.

In November I added two more loads of horse manure to each heap, and had the whole worked over and composted. In the spring another small quantity of manure was added, and another turning and mixing of the compost heap prepared it for use. This was evenly spread over the surface, say thirty-five loads of compost to the acre, and upon this was sown one hundred pounds of guano, and the whole ploughed under to the depth of seven inches.

Cost of ploughing and harrowing, . .	$4 00	
Planting, with machine, $1; rolling, 67 cts.,	1 67	
Seed corn, 75 cts.; hoeing, three times, $8, .	8 75	
70 loads of compost, at 60 cts. per load, .	42 00	
200 lbs. guano, ...	6 00	
Interest on land, at $100 per acre, . .	12 00	
		$74 42
I harvested from the same 327 bushels ears, equal to 163½ bu. shelled corn, valued at $1 per bu.		163 50
Profit, ...		$89 08

Corn fodder with the poor corn not reckoned in the above, together with a small lot of pumpkins, will amply pay the expense of harvesting.

Statement of Austin L. Clark.

This crop was grown upon one acre of sandy loam, on which I applied, last year, ten loads of manure. The first week in May I ploughed and turned in ten loads of yard manure, about eight inches deep. I then spread on nine loads of compost and harrowed in. On the 16th of May, I planted in rows three feet apart—hills three feet four inches apart—and put five bushels of ashes in the hills, which were not raised. I hoed three times. On the 24th of September the crop was harvested.

Value of crop:—		
91¼ bushels of corn, at $1, . . .	$91 25	
3 tons of fodder, at $6, ...	18 00	
9 bushels of soft corn, at 25 cts., . .	2 25	
		$111 50

Expenses:—		
19 loads of manure, at $1,	$19 00	
5 bushels of ashes, at 22 cts.,	1 10	
Ploughing and harrowing,	2 00	
Hauling manure and planting seed,	3 50	
Hoeing, cutting and stacking,	6 50	
Carting and husking,	6 50	
Interest on land,	5 00	
		$43 60
Net profit,		$67 90

SUNDERLAND, Nov. 15, 1855.

NORFOLK.

From the Report of the Committee.

The season has been peculiarly unfavorable to corn. That which was planted early and well attended to yielded about an average crop; but nearly all was attacked by the early frosts so severely as to diminish the amount of sound corn to a large extent. The smallest estimate we have heard is that of Mr. L. Clapp, of Stoughton, who reckons his loss at ten per cent. Others consider that the frost injured their corn to the extent of a quarter or even a third of an average yield. This experience will probably suggest the importance of early planting. We know that the time of planting depends on so many circumstances, such as weather, the condition of the land and the general forwardness or backwardness of the season, that no rule can be laid down applicable in all cases. We have usually noticed that those who plant as early as the season will permit, are most sure of a crop. There is less danger from the late frosts of spring than from the early frosts of autumn. Though the early-planted corn may seem to grow slowly at first, yet it is then striking its roots into the manure and preparing for a vigorous start whenever the hot weather shall come.

The early frost also renews the question of what kinds of corn should be planted. There is no uniformity of practice among the farmers in this respect. There ought not to be. The smutty white, the brown, the large eight-rowed yellows, and the

small, so-called, Canada, are the favorite varieties. Each man consults the records of his experience, the nature of his soil, the amount and quality of his manure, and selects for planting that kind of seed which he thinks (taking these things into consideration,) most likely to yield the largest crop. So uncertain, however, is our climate, that the largest crop may not always be safest, and common prudence would dictate that, in the selection of seed, a farmer should remember the possibility of an early frost. He can afford to make some deduction from the yield to insure its early ripening.

It will be seen from the interesting report of Mr. Clapp, that guano may be used under corn to advantage. If all our farmers, who are able, would conduct their experiments with equal care, and note the results with equal minuteness, a large amount of useful knowledge would soon be obtained. What we want is certainty—at least definite statements of experiments accurately conducted—including all the elements of the operation. Then if the experiment is a failure, we should know *why* it failed; if successful, we can profit by it. In either case a positive addition is made to our agricultural knowledge.

Every year we have the same question propounded and discussed as to the profitableness of Indian corn. On no other subject do opinions vary more widely. On no other do farmers more nearly agree in practice. We do not believe they would continue to grow corn and to enlarge their fields according to their ability, unless there was good reason for the common opinion that it pays for cultivation. The average yield in this county is about thirty bushels to the acre. Farmers can better afford to raise fifty bushels than thirty. Is it too much to hope that the time is coming when, in consequence of increased knowledge and facilities of operation, fifty bushels to the acre will be the average production in this county?

J. M. Merrick, *Chairman.*

Statement of Lucius Clapp.

The kind of corn raised by me is the brown corn, originally from New Hampshire. Its weight, when dry, is sixty pounds to the bushel. My piece of land contains, by measurement, just

an acre. Soil, a light, gravelly loam. It was planted last year with potatoes in the sward, with a shovelful of manure in the hill, the hills being four feet apart each way. The crop was two hundred bushels. It was ploughed this year the second week in May, seven inches deep, and eight cords of stable manure were spread, harrowed and ploughed in. I furrowed one way, in rows four feet apart, and planted on the 17th and 18th of May, in hills two feet apart in the row. I put a table-spoonful of guano in each hill, and covered it with about an inch and a half of loam, before dropping the seed; then planted four kernels in each hill, and hoed three times—the last time without ploughing. The stalks were cut on the 10th of September, and the corn was harvested the 15th and 16th of October. I finished husking the 24th of October, and had one hundred and thirty-five baskets, weighing, when shelled, thirty-five pounds to the basket, and making eighty-four and three-eighths bushels, at fifty-six pounds to the bushel.

To ascertain the weight of the cobs, I shelled, November 8th, two bushels of ears. The first weighed in the ear thirty-eight pounds and ten ounces; the corn weighing twenty-nine and a half pounds, and measuring nearly seventeen quarts; the cobs, nine pounds and two ounces. The second bushel weighed in the ear thirty-nine pounds: corn, twenty-nine and three-fourths pounds; cobs, nine and one-fourth pounds: corn measuring seventeen quarts.

Expense:—

Interest on land,	$3 00
Taxes,	30
8 cords of manure spread,	48 00
Guano, 275 lbs.,	8 00
Ploughing and planting,	10 00
Seed,	50
Hoeing,	9 00
Cutting and binding stalks,	4 50
Harvesting,	9 50
	$92 80

Crop, stalks and husks,	$33 00
Manure unspent,	25 00
81⅜ bushels of corn, at $1.04,	8 05
	$146 05
	92 80
Profit,	$53 25

The frost on the night of August 31 injured some late planted corn in this neighborhood, to the estimated extent of nearly one-half. My own, I think, was injured from the same cause at least ten per cent.

You will see by my statement, that I have used some guano. To test its value, four rows were planted without guano. These were harvested separately, and compared with four rows adjoining. The result was at the rate of ten bushels to the acre in favor of guano, the corn being also sounder. In another experiment on swardland, where a table-spoonful of guano was put in each hill without any other manure, the result was nearly a total failure, yielding only at the rate of ten bushels to the acre, of sound corn, while the corn adjoining, planted with a shovelful of compost manure in the hill, yielded at the rate of thirty-eight bushels. The corn treated with guano, although planted first, was behind the other through the season, and of course was more injured by the frost.

I have used guano with potatoes, when a table-spoonful was put in the hill; the result, as compared with a shovelful of manure in the hill, was as six bushels with guano to seven with manure, the potatoes being of equal quality. Soil, a light, gravelly loam. I have also tried an experiment on grass land, one hundred and fifty pounds being sown on half an acre of low, moist land. The guano was sown at the commencement of a heavy rain, about the 20th of April. In this case, the result was highly satisfactory; the crop being double of last year, while all around it was lighter. In another experiment on grass, made about three weeks later, on higher land, and in fair weather, no perceptible difference was noticed. Squashes, turnips, beans and pease, were raised successfully with guano.

Onions, a total failure; beets, nearly so. It was also used with barley and a small piece of wheat; but, as no comparison was made with other manures, its value in these cases could not be ascertained; the crops, however, were good.

I have often heard the opinion expressed, that a hundred bushels of corn could not be raised on an acre; but I am satisfied that if on a rocky, thin soil, eighty-four bushels can be raised in an unfavorable season, one hundred may easily be raised on a suitable soil in a favorable season. In fact, the opinion was often expressed, that, had the season been favorable, one hundred bushels would have been raised on the acre offered by me for premium. I have no doubt that, with high manuring and high cultivation, corn may be made a profitable crop. Without these conditions, no crop can be made profitable.

LUCIUS CLAPP.

STOUGHTON, Nov. 10, 1855.

Statement of E. and J. Sias.

The field of corn which was entered by us for a premium was measured by Mr. Charles Breck, and contained, in the whole, one acre and thirty-four rods. Our method of cultivation was as follows: The land, which was in grass, was ploughed with a double mould-board plough, the 24th of April. On the 28th of April, about four and three-fourths cords of piggery manure was spread and harrowed in. The field was marked out with a plough only one way, in rows three feet apart, and manured in the hill with about four and a half cords of compost barn manure. It was planted, from the 8th to the 11th of May, with what we call the Plymouth county or smutty white corn, in hills about two and a half feet apart, four kernels making a square of six inches, with one in the centre. We are of the opinion that we can raise as much corn by planting three feet apart each way as in any other. The field was cultivated three times and hoed twice; hilled up but very little. The stalks were cut from the 8th to the 12th of September, sunned one day, and then hung up under the roof of the barn until perfectly dry. We think that the corn was injured very much by the dry weather, and also by the high winds, which

injured most of the corn in this vicinity very much. It was not injured much, if any, by the frost. We prefer planting early: we had rather be cut by the frost in the spring than in the fall. The corn was harvested the last of September and the first of October, and there were two hundred and thirteen baskets of sound corn and eleven of refuse (considered equal to five of good corn),—making two hundred and eighteen baskets from one acre and thirty-four rods, being at the rate of 109.15 per acre. We had selected what we thought before harvesting to be the best acre, which we kept by itself, and carefully weighed, and there were 109.89 bushels.

Value of the crop:—		
109.89 bushels of corn, at $1, . . .	$109 89	
1½ ton of stalks, ...	18 00	
2 " husks and butts, . . .	12 00	
		$139 89
Cost of crop:—		
Interest on land, $200 per annum, . .	$12 00	
Taxes, about	1 30	
8¼ cords manure, two-thirds exhausted, .	31 00	
Ploughing, ...	5 00	
Spreading manure and harrowing, . .	5 00	
Manuring in the hill and planting, . .	6 50	
Hoeing, ...	9 50	
Cutting and housing stalks, . . .	5 25	
Harvesting and husking, ...	7 75	
		$83 30
Profit per acre, ...		$56 59

In the above statement, we have put the value of the corn at one dollar per bushel, which is about eight or ten cents below the present value. But of this as well as the other estimates the committee can judge for themselves. The labor, although higher than many reports that we have seen, we think is as low as we should be willing to do the same for any other person.

Milton, Nov. 9, 1855.

Statement of Mr. Twombly.

The field of corn which was entered by me for a premium was measured by Mr. Charles Breck, and contains one acre and a quarter and eleven rods, and is the same field which was planted last year with corn, (with a few rods added,) an account of which was reported through you to the society. This spring it was ploughed with a horse, after spreading about three and a half cords of manure to the acre. It was then marked out with a plough one way, and manure put in the drills at the rate of about three and a half cords per acre, making in the whole about seven cords per acre. The field was planted, about the middle of May, in drills, the kernels about six inches apart in the drills, with the Plymouth county or smutty white corn, the rows from three and a half to four feet apart. It was ploughed and hoed twice. The last of September and the first of October, the whole was cut up at the bottom, carried to the barn and husked, and we had two hundred and forty baskets of good corn and eight of pig corn, which I think is equal to four of good, which would make two hundred and forty-four baskets. I have shelled and weighed several baskets, and found them to average 29.75 pounds each, equal to 129.62 bushels of 56 pounds each, on one acre and a quarter and eleven rods of land, being at the rate of 98.29 bushels per acre. The land on which the corn was raised is a strong loamy soil, sloping to the west. I think that it was not injured by the frost; but a part of it was, very probably, by the dry weather, and the whole of it was very much, as you saw, by the high wind, which nearly levelled the whole field. Had I selected the best acre, I have no doubt that it would have produced over one hundred bushels.

The value of the crop I estimate as follows:—

129.62 bushels of corn, at $1 per bushel, .	$129 62	
$4\frac{1}{2}$ tons of corn-fodder and stalks, at $9,	40 50	
		$170 12

Expense of cultivation I have estimated as follows:—

Interest on the land at $200 per annum, .	$16 00
Taxes supposed to be about . . .	1 30

Carting manure, ploughing, hoeing, &c., .	$27 00	
8¼ cords of manure, at $6, less one-third, .	33 00	
Harvesting and husking corn, . . .	10 00	
		$87 30
Profit, ...		$82 82

from one acre and a quarter and eleven rods, or at the rate of $62.80 per acre.

I have estimated the value of the corn-fodder at $40.50, from the fact that last year the fodder from a smaller piece of ground, which was saved by salting down with five or six hundred pounds of barley straw, kept my cow through the winter without any grain in as good order as she could have been kept on two tons of English hay.

MILTON, Nov. 9, 1855.

PLYMOUTH.

Statement of Artemas Hale.

The acre of land upon which I have raised the Indian corn, for which I made application for the society's premium, is of a gravelly soil. It was laid down to grass about nine years ago, and has been mown every year since, without any application of manure until last year, and has produced a fair crop of hay.

Last year about one-half of it was ploughed and planted to corn, and with only a moderate portion of manure, yielded quite a good crop.

Before ploughing, this spring, I spread upon it forty-two horse loads of manure, and after ploughing, thirteen loads more, making in all fifty-five horse loads, equal to twenty-eight wagon loads of forty cubic feet each. About one-half of the manure was of poor quality, taken from the barnyard and composed of refuse corn-fodder, poor hay, and the droppings of two cows, mixed with soil carted into the yard the summer previous, and from the hotel stable. The residue was of very superior quality. It was taken from the barn cellar, and had never been exposed

to the rays of the sun, to drenching rains, or currents of air. I have a stone floor to the cellar that retains all the urine from the cattle, which is of great value. From many years' experience I am fully of the opinion that manure made without being exposed to the sun and air possesses much greater fertilizing qualities than otherwise.

The ground was ploughed on the 11th of May, six and a half to seven inches deep. After spreading the thirteen loads of manure, it was well pulverized and the manure worked in with the harrow and cultivator.

The corn, which was "smutty white," or, as it is sometimes called, "Whitman corn," was planted on the 21st, 22d, and 23d days of May, in rows three feet apart one way and seventeen inches the other, three kernels in a hill.

It was cultivated, or ploughed, and hoed three times. A considerable part of the field was infested with that most troublesome of all grasses, generally known here by the name of "twitch grass." This accounts for the more than ordinary expense of hoeing, as my workman was very particular and persevering in his efforts to keep it down and subdue it.

The stalks were cut about the middle of September.

Expenses:—

Manure, 55 horse loads, or 28 wagon loads:		
" 14 loads at $1,		$14 00
" 14 " $2,		28 00
Carting and spreading,		6 00
Ploughing,		5 00
Harrowing and cultivating,		1 50
Planting,		3 50
Seed corn,		1 00
Ploughing, cultivating and hoeing, three times,		15 00
Cutting stalks and binding,		3 75
		$77 75
Deduct half the manure, unexhausted,	$21 00	
Corn stalks,	11 50	
		32 50
		$45 25

I allow the butts for harvesting.

[It is stated that $130\frac{71}{85}$ bushels of corn were raised on this acre. No statement is made in regard to the manner of measuring the corn, but from Mr. Hale's well-known character it is presumed that he would not have allowed such a statement to be published without having had the corn on the whole acre accurately weighed, or otherwise accurately measured, and that, too, after it had become dry and good merchantable corn. This is obviously the true and only method of arriving at a result which could justify the statement of so extraordinary a yield, without any allusion to the method of measurement.

Too much care cannot be taken to state the exact mode of arriving at the aggregate yield, especially when so large a crop is reported. And again, if the whole was weighed, which is, perhaps, the most reliable method, it should have been stated when it was done, whether as soon as taken from the field and husked, or afterwards, since most varieties of corn, shrink from ten to twenty-five per cent., under ordinary circumstances, between the time of gathering and the first of January. In the Agriculture of Massachusetts for 1853, page 148, it was suggested that "a proper regard to truth, and justice to other parts of the State, should induce committees to require the utmost strictness in measurement; and to prevent any discouragement, that the societies should offer such premiums as will compensate for any amount of time which may be required." An experiment made by the late J. E. Howard, and reported in the above named volume, page 150, shows, so far as it goes, that the "smutty white," or "Whitman corn," shrinks more in weight than the yellow varieties, the former having shrunk at the rate of seven pounds per bushel, the latter at the rate of three, only, between the 10th of January and the 21st of April.

It must be obvious that unless great care is taken in measuring accurately all crops like the one stated above, the statements are not only useless, but positively injurious, since they mislead, and at the same time throw great discredit upon well meant efforts to advance the cause of practical agriculture.

By the returns of the Statistics of Industry, made during the past year, it appears that there are 89,773 acres of Indian corn raised in the State, or 2,244,325 bushels, valued at $2,722,208.—Ed.]

BROOMCORN.

HAMPSHIRE.

Statement of Albert Montague.

My broomcorn was raised on one acre of Sunderland meadow. It was planted to corn in 1853, and last year I took off a light crop of rye. In May, 1855, I applied eight loads of manure, spread evenly and ploughed in. I planted with Woodward's planter, the hills two and a half feet apart, and the rows about three feet apart. I dropped in the hills about fifty pounds of super-phosphate of lime, mixed with fifty pounds of plaster, hoed four times, and left the ground nearly level. I used a cultivator between the rows three times, and the last time nothing but the hoe, merely cutting the weeds, that they might not seed. I harvested on the 11th, 12th and 13th of October.

Value of crop:—

1,129 pounds of brush, at 10 cts., . .	$112 90	
66 bushels of seed, at 45 cts., . .	29 70	
		$142 60

Expenses:—

Ploughing, harrowing and planting, . .	$2 50	
Manure in the hill, ...	10 50	
Hoeing, $8; harvesting and scraping, $10,	18 00	
Interest, ...	9 00	
		$40 00
Net profit, ...		$102 60

SUNDERLAND, Nov. 14, 1855.

Statement of N. A. Smith.

My piece of broomcorn is part of a field of sandy loam, on which I raised broomcorn last year. I ploughed early in May, and put on about twelve loads of manure, well pulverized, and ploughed it in. I planted, the 8th of May, with Woodward's planter, and dropped in the hill one hundred pounds of DeBurg's super-phosphate of lime. I hoed three times, and afterwards cut the weeds. The crop was harvested about the 10th of October.

Value of crop:—

1,022 pounds of brush, at 9½ cts., . .	$97 09	
86½ bushels of seed, at 67 cts. per bushel,	57 95	
		$155 04

Expenses:—

Ploughing, harrowing, planting and hoeing,	$10 00	
12 loads of manure, ...	15 00	
100 pounds of super-phosphate, . .	3 00	
Harvesting, scraping, and cleaning seed, .	10 00	
Interest on land, ...	9 00	
		$47 00
Net profit, ...		$108 04

SUNDERLAND, Nov. 14, 1855.

WHEAT.

WORCESTER NORTH.

Statement of Amory Davidson.

The acre of land on which my wheat was raised is a gravelly, or rather cobbly loam. It was planted two years previous, the first year on the sod, and manured in the hill with a small shovelful of compost from my barnyard. Last year I ploughed in twenty-four cart-loads of green manure from my barn cellar, and manured in the hill the same as the year before. This year I washed my seed and let it soak twenty-four hours, then stirred in slacked lime and plaster to separate it, and sowed two bushels of the *coffee wheat* to the acre, and harrowed it in thoroughly, bushed and rolled the ground down flat and smooth. After it was up about four inches high, I sowed on three hundred pounds of plaster. I harvested it the middle of August, and had thirty-two and three-fourths bushels to the acre by measure, or a fraction over thirty-four by weight, which was sixty-two and a half pounds to the bushel. It was cut before the straw was turned fully yellow. My seed cost me

three dollars per bushel, and I reckon the same price on the crop, as I had promised for seed, for another year, all I have to spare, at the same price, before it was harvested.

Value of crop:—		
34 bushels of wheat,		$102 00
1 ton of straw,		8 00
		$110 00
Expenses:—		
Ploughing,	$2 00	
Seed,	6 00	
Sowing and harrowing,	1 50	
Bushing and rolling,	75	
Three hundred pounds plaster,	1 05	
Harvesting,	3 00	
Threshing and cleaning,	4 50	
Interest on the land,	4 50	
		$23 30
Balance in favor of crop,		$86 70

AMORY DAVIDSON.

STERLING, 1855.

NORFOLK.

From the Report of the Committee on Grain Crops.

The season was generally considered favorable to small grains; and from several parts of the county we hear of good crops, and have seen many fields apparently equal to any that were entered for premiums. The high price of bread stuffs has induced many to try the cultivation of wheat, and they have found it profitable. From twenty to twenty-five bushels have been grown upon an acre, with but little more trouble or expense than would have been incurred for a crop of rye. The general prejudice against the cultivation of wheat begins to wear out, where it is found that failures do not result from our climate, nor from the fact that our lands have been long under the plough, but mainly from over-stimulation with rank

manure. Wheat sown on turned-in clover, or on good land, well manured and cultivated the previous year with potatoes, yields a fair return. Strong manure, applied directly to wheat, causes the stalk to grow rank and tender, and to be easily blasted. Numerous instances of success, the present year, justify the belief that our farmers will turn their attention more and more to this crop.

Statement of A. L. Smith.

The field of wheat which I enter for premium contains one half acre by measurement. Planted with corn last year, and manured with a shovelful of compost in the hill—all the manure the field has had for twenty years. Soil, a gravelly loam. The 28th of April, I ploughed the land seven inches deep. On the 29th, sowed one bushel and two quarts of Scotch Fife wheat. Before harrowing, I spread four bushels of ashes and one bushel of air-slacked lime, which were harrowed in with the wheat. It was harvested the first week in August, and produced nine bushels and two quarts. The seed was not soaked in any preparation. The field was free from rust and smut during the season. The kernel plump and sound.

Expense :—

Interest and taxes,	$1 66
Ploughing and sowing,	1 62
Seed,	3 72
Ashes and lime,	50
Harvesting and threshing,	2 00
	$9 50

Crop :—

Nine bushels and two quarts of wheat,	$18 12
Straw,	4 00
	$22 12
	9 50
	$12 62

Dover, November 10, 1855.

RYE.

ESSEX.

From the Report of the Committee.

In the absence of any statement on the cultivation of rye, perhaps it would not be inappropriate to lay before the society the result of an experiment in the cultivation of that crop on the town farm in South Danvers. The soil on this farm is shallow and very gravelly; and it has been the practice, in the cultivation of crops here, to manure sward ground in the fall, using four cords of manure to the acre, ploughing it in six inches deep. In the spring following, it is cross-ploughed eight inches deep, well harrowed, and planted with corn, potatoes, beans, &c., using about a teaspoonful of plaster in the hill; good crops are almost always obtained. The next spring, the same land is manured with three cords of manure to the acre, *ploughed in deep*, and planted with vegetables, using plaster in the hill as before. The manure used is such as is made on the farm by swine and cattle, and worth six dollars per cord.

In October, 1854, after the crops had been taken off the ground, seven and three-fourths acres of land thus treated were sown to rye, eight bushels of seed being used. The grain came up well, and stood the winter tolerably well, though it was killed in many places to a small extent; the spring was favorable, and it grew finely, and by the fifteenth of July it was headed and well filled with grain.

It was cut with *cradles* the last of July, before the grain was fully ripe, (or in what the western farmers call the *dough*.) By doing this the straw will be of a bright, beautiful color; the grain will be more full and plump, and will make better meal than when left to become dry and hard before cutting. The grain was bound in *small* bundles, carefully shocked in the field, where, on account of the wet weather, it remained for more than twenty days before it was sufficiently dry to put in the barn; but, care being taken to keep the shocks upright, it sustained but little injury. It was gathered into the barn in good condition, and immediately threshed out. The yield was

two hundred and twenty-nine and one-half bushels, weighing fifty-six pounds to the bushel, one hundred and sixty bushels of which were sold for $1.50 per bushel; eleven tons of straw, eight tons of which were sold at an average price of sixteen dollars per ton.

The crop is charged with one-third part of the manure used on the land in the cultivation of the two preceding crops,

Valued at	$112 00
Ploughing, at $3 per acre, ...	23 00
8 bushels of seed at cost, ...	10 00
Sowing and harrowing, ...	7 50
Harvesting, ...	25 00
Four men threshing 12 days, ...	48 00
Expenses, ...	$225 50
Value of 229½ bushels of rye, at $1.50 per bushel,	$344 25
Value of 11 tons of straw, at $16 per ton, . .	176 00
Value of crop, ...	$520 25
	225 50
Leaving a profit of	$294 75

ADINO PAGE, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of George Dickinson.

My crop of rye grew on three acres and twenty-seven rods of first quality meadow land. The yield was eighty-eight bushels twenty quarts, or twenty-eight bushels per acre. The land for two years previously was planted to Indian corn, with about twelve loads of manure per acre. After the corn was cut and stacked, the ground was ploughed from eight to ten inches deep, and was sown, the 18th and 20th of September, with three bushels of seed.

The crop was harvested the last of July, and threshed the last of August.

The account stands as follows:—

For ploughing, harrowing and sowing,		$6 50
" harvesting and housing,		10 00
" threshing and cleaning,		8 00
" interest on $190 per acre,		36 00
" taxes,		3 50
		$64 00
By 88 bush. 20 qts. of rye, at $1.25 per bush.,	$110 75	
" 4 tons of straw, at $6 per ton,	24 00	
		$134 75
Profit,		$70 75

HADLEY.

OATS.

ESSEX.

Statement of William Foster.

I offer for premium a crop of oats, raised upon a piece of rather ordinary land, which was broken up in the fall of 1852, sown with oats in the spring of '53—the crop was fair for sward ground. It was ploughed in August following, the stubble well covered, and manured in the spring of '54 with thirty cart loads, of about thirty-five bushels each, of compost manure, twenty of which were ploughed in, the remainder put in hills, and planted to corn. The crop, in consequence of drought, was rather a light one. This spring it was well ploughed, the last of April, and sown, the first day of May, with four bushels of oats, well harrowed, seeded to grass, and rolled. The oats were cut with a cradle, the 4th of August, threshed and winnowed the 10th, and found to measure seventy-eight bushels, two of which were weighed, and found to weigh thirty-two pounds each.

Value of crop, at 66 cts. per bushel, 45 of which I sold at that price, in August last,	$51 68
Thirty hundred of straw, at least,	10 00
Total,	$61 68

The cost of raising said crop was as follows:—

To one day's work of myself and one yoke of oxen,	$3 00	
Cost of seed at 80 cts. per bushel,	3 20	
To one day's work of myself, man, and one yoke of oxen, sowing, harrowing and rolling,	3 00	
To cradling, binding, getting in,	3 00	
To threshing, cleaning, etc.,	3 00	
		$15 20
Profit of crop,		$46 48

North Andover, Oct. 25, 1855.

WORCESTER WEST.

From the Report of the Committee.

The committee would suggest to all those who make entries for premiums, that they should be careful to file their statements in season, one great object of the society being lost when they neglect to comply with the rules—competition being necessary to keep up the interest, as, also, much valuable information is lost.

In the certificate filed by Peter Harwood, he mentions his crop of oats and rye, raised upon one acre and twenty-five rods of land, amounting to eighty-six bushels, being about seventy-five bushels to the acre, which is a greater yield than of clear oats, sown upon the other part of the field.

The committee would here remark, that many experienced farmers have practised sowing oats and rye together, as in the above case, with good success. One fact seems to be established, that rye sown among oats is less liable to rust; the weight being increased, the crop becomes more valuable.

There being no provision made in premiums for mixed crops, the committee recommend a gratuity of two dollars.

Cephas Willard, *Chairman.*

Statement of Peter Harwood.

The piece of land on which the following amount of grain was raised, which I offer for premium, has a gentle slope to the east. The upper part of it I sowed with rye and oats, mixed

together—about one-third rye—one acre and twenty-five rods. The average yield on this was seventy-five bushels to the acre—weight, thirty-five pounds to the bushel.

The lower part of the piece, two acres and sixty-four rods, I sowed with oats, the average of which was seventy-four and one-third bushels to the acre—the weight of which was thirty-one pounds to the bushel.

The whole piece of land is three acres and eighty-nine rods; and the average yield, on the whole piece, rye and oats, and clear oats, was seventy-four and one-half, and a fraction over, bushels to the acre.

The above statement presents a fact worth knowing, it seems to me; for if one can obtain more bushels, and likewise more weight, by mixing rye with his oats, it pays to do it; and this was done, too, on the upper part of the field, where one would expect to get the lightest yield.

The piece of land was manured all alike the year before, and not with the expectation of a premium crop. Last year it was turned over greensward and planted with corn. Spread on seventy-eight loads of green manure, from the stable, and put half a shovelful of compost in the hill. And you will here notice that the stable manure was made by one of my new-fangled notions, of allowing my cattle to stand on the manure, and bed or litter with sawdust and turning shavings, mostly,—and they were almost wholly made of white pine, the turpentine of which is said to be so injurious to vegetation.

HAMPSHIRE.

Statement of Albert Montague.

The acre of sandy loam, upon which I raised oats, was in corn last year, and yielded a fair crop. In 1854, I ploughed in fifteen loads of green manure, and put a little compost in the hill. In the fall, after the corn was harvested, I ploughed about eight inches deep, and sowed oats early in the spring of 1855—25th of April—at the rate of four bushels to the acre. I harvested, the 8th of August, and threshed in September.

Value of crop:—		
61¼ bushels of oats, at 50 cts., . . .	$30 62	
1¾ ton of straw, at $8, ...	14 00	
		$44 62
Expenses:—		
Seed, ploughing, harrowing and sowing, .	$5 00	
Harvesting, threshing, and interest on land, .	7 50	
		$12 50
Net profit, ...		$32 12

SUNDERLAND, Nov. 14, 1855.

ROOT CROPS.

[By the returns of the Statistics of Industry, for the year ending June 1st, 1855, it appears that the number of acres of potatoes in this State is 41,935, and the estimated average number of bushels, per acre, is 92½, making the aggregate amount raised in the State 3,878,487 bushels, valued at $2,509,219. The number of acres of onions is 877½. The average number of bushels, per acre, is returned as 281, which is probably far too low, making the aggregate number of bushels 206,577, valued at $27,104. From these returns it appears, also, that there are cultivated 2,219 acres of turnips, with an average yield of 248 bushels per acre, making in all 550,312 bushels, valued at $131,347. Number of acres of carrots, 1,459; estimated number of bushels, per acre, 461, making an aggregate of 672,599, valued at $142,678. While of beets there were raised 3,838 acres, valued at $439,444.—ED.]

ESSEX.

Statement of John Peaslee.

CARROTS.—I find the entire piece on which my carrots grew is a few rods short of half an acre—the exact measurement is fixed by the certificate of Joshua Buxton, Jr., a competent surveyor.

I gathered therefrom seventeen tons and four hundred pounds, as weighed at the town scales. The land is a strong, hard soil. For two years next previous, cabbages have been grown thereon. It has been manured, as I usually manure my land, not sparingly. It was ploughed to the depth of ten inches, and was covered over with a full coating of muscle bed, as taken from the bed of the river, and this was all the fertilizer applied the present season. The plants did not come up well, there being many spaces of a foot, or more, in the rows, where no plants were to be seen; but the latter part of the season they came forward finely, there being very few plants less than three inches in diameter, and many of them were as large as my arm, which is not wanting in a fair share of muscle, made more effective, probably, by the labor applied in the cultivation of the crop—for it is a rule with me never to suffer weeds to occupy the ground where useful plants are needed to grow. I sowed my carrots at the usual time, and weeded them in the usual way. I did not think of offering them for premium until I found my crop unusually large—larger than I have ever before grown, and I believe I have grown as large as any of my neighbors; and I do not know any neighborhood, where the proprietors of land do their own work with their own hands, where the crops have better attention than on the strong and hard land of South Danvers.

South Danvers, Nov. 14, 1855.

Statement of Paul T. Winkley.

Ruta Bagas.—The land upon which the ruta bagas grew, which I enter for premium, is a black clay loam, with a clay subsoil. About half of the piece was manured and broken up last year, and planted to corn, in drill, for green feed for cows; the other half was broken up this year, and one-half of that manured at the rate of twenty loads to the acre, ploughed in, and the other half without any manure, but after it was ploughed we hauled on sand, at the rate of about fifty loads to the acre. The crop when the sand was put on was quite as large as on any part of the piece.

After it was harrowed, one man went along with a hand rake and leveled off a narrow space for a drill. I followed, sowing

the seed with my fingers, another man followed me, raking in the seed, going about as fast as a man usually walks, sowing the whole in one-half day. The drills were about two and one-half feet apart. Three-fourths of a pound of seed were sown on the 27th of June.

Cost of crop:—	
Interest on land,	$6 00
Seed,	75
Manure, sand and hauling,	25 00
Ploughing and harrowing,	3 00
Sowing seed,	2 00
Hoeing and thinning out,	10 00
Harvesting,	5 00
	$51 75

334 bushels, at 30 cents per bushel, which is one-half cent per pound,	$100 20
Leaving the profits,	$48 45

We finished gathering the crop, Nov. 12, and found it to be three hundred and thirty-four bushels—sixty pounds to the bushel.

I have about come to the conclusion that we do not value the ruta baga, or Swedish turnip, high enough, and that we estimate carrots too high. I am testing the relative value of ruta bagas and carrots for milch cows. I have always supposed that it would not do to feed milch cows with ruta bagas, that they would affect the taste of the milk, but I now think it is not so. I have now been feeding my cows the last week on ruta bagas, commencing with about four quarts per day, and increasing to a peck per day. I have not yet detected any thing in the milk which is offensive. I intend to continue to feed with ruta bagas two or three weeks longer, and then feed with the same quantity of carrots, measuring the milk, so that I can ascertain the difference, if any.

Newburyport, Nov. 14, 1855.

WORCESTER WEST.

From the Report of the Committee.

However people may differ with regard to other roots, there can be but one opinion about the potatoe crop; its importance here is certainly second to none other, except it be the corn or maize crop, and perhaps not even that.

A subject of such paramount importance should excite general interest, and the very best means should be adopted to encourage the agricultural community to discover and communicate to the public the best mode of producing and preserving this useful article of food, and profitable article of commerce.

It is certain that the average quantity of potatoes per acre has very much diminished in the last twenty years, notwithstanding all the improvements in other branches of agriculture, not only in this vicinity, but generally through the country, and the question suggests itself, whether, in our list of premiums, the *minimum* quantity entitled to premiums is not too high.

It is certain that in very few instances three hundred bushels of potatoes have been grown on one acre, in this county, for the last twenty years; and certainly, low prices have not discouraged the use of the best means to produce large crops, and it is not likely that the *cause* of but a single application, (in due form,) for the society's premiums, is attributable to want of exertions on the part of the cultivator to produce large crops.

By putting the least quantity entitled to a premium too high, we may, perhaps, shut ourselves out from a very large amount of valuable information, as the most important and successful experiments may fail of realizing the specified amount.

The *amount* of the produce is not of so much interest to the public as the *modus operandi* of obtaining, with more certainty, a satisfactory crop. The kind of seed, with its adaptation to certain soils; time and manner of planting; kind and manner of application of manure; time and manner of cultivating or dressing; time and manner of harvesting and storing, are among the questions important to be discussed and understood. And the production of new varieties from seed is a subject worthy the attention of farmers. Very little attention has been paid to this, and consequently, we have only very few varieties of good, productive table potatoes.

There can be no doubt that a great many more kinds might be procured by cultivating the seeds from the apples or balls, which is just as easy as the cultivation of beets from seed, though some would have us think it difficult and uncertain as rearing chickens by artificial heat; and, lest anybody should be discouraged from making experiments because he has no hot-bed, it is a fact that seed sown last June produced tubers as large as hens' eggs, and with no more trouble or skill than is necessary to raise beets or turnips.

AMORY FELTON, *Chairman.*

WORCESTER NORTH.

Statement of William J. Clifford.

CARROTS.—My crop of Carrots was raised in the following manner, on eighty-one rods of land, which, for six years previous, had been in a good state of cultivation. Before ploughing, eight good ox cart loads of well rotted barnyard manure, mostly from the horse stable, were spread and ploughed about eight inches deep, the last of May. Three or four days afterwards I ploughed again, and sowed broadcast seventy pounds of guano; then raked well and sowed the seed with a machine, in rows about sixteen inches apart. I hoed with the hand hoe three times, but did not thin them out at all. In the early part of November I harvested from two square rods, which were considered no better than the average of the whole field, eight hundred and fifty pounds of carrots, making on the eighty-one rods, 34,425 lbs., being at the rate of 68,000 lbs., or $1{,}236\frac{2}{5}\frac{0}{5}$ bushels of 55 lbs., per acre.

Expenses:—

Ploughing,	$2 00
8 loads of manure at $2,	16 00
70 lbs. of guano,	2 10
Seed, raking and sowing,	2 00
Hoeing, three times,	6 00
Harvesting,	17 00
	$45 10

34,425 lbs. carrots—17 tons 425 lbs.—at say		
$12 per ton, ...	$206 25	
Tops, ...	8 00	
		$214 55
Profit, ...		$169 54

Statement of Joel Haywood.

CARROTS.—The crop of carrots which I offer for premium was 7,166 pounds, grown upon twenty-one square rods of ground; making the amount grown upon an average square rod $341\frac{4}{21}$ lbs., making one hundred and twenty-four bushels of fifty-five pounds to the eighth, or nine hundred and ninety-two bushels to the acre. The ground had been in grass five years previous to the fall of 1854, when it was broken up with a double Michigan plough, eight inches deep. In May, 1855, I spread four loads of green manure, from my barn cellar, and ploughed it in twelve inches deep; then spread twenty loads of compost, and harrowed it in, and bushed and sowed it, the 19th of May, in rows, fourteen inches apart; then hoed three times and thinned from two to three inches apart. I have never raised the same amount of carrots, with the same labor.

Expense of crop:—		
Ploughing, and carting manure, ...		$1 00
Spreading manure and sowing, ...		33
Seed, ...		75
Hoeing and thinning, ...		5 00
Harvesting, ...		4 00
Manuring, ...		4 00
		$15 08

Value of crop:—		
$3\frac{1}{2}$ tons of carrots, at $12 per ton, . . .	$42 00	
For tops, ...	2 00	
		$44 00
Net profit, ...		$28 92

Statement of B. Safford.

POTATOES.—The land on which I tried my experiment has been in grass some eight years, without any manure. In the fall of 1854 it was turned over, and last spring ploughed again. It is on a side hill, and I think if the whole piece had been manured with one kind of manure, there would have been one-quarter more potatoes on the lower than on the upper side. The piece being long and narrow, I furrowed lengthwise, making eighteen rows, and one hundred and thirty hills long. I commenced planting on the lower side.

Lot.	Manure.	Poduct of 10 hills.
No. 1.	Horse manure, a shovelful to the hill, .	*26½ lbs.
" 2.	Guano, a large table spoonful to the hill, .	27¾ "
" 3.	Guano and plaster, equal parts, a spoonful,	27 "
" 4.	Guano and muck, one part guano, three parts muck, a handful, ...	26½ "
" 5.	Droppings during the previous summer from the turkey roost, which had laid out under the tree all winter and spring, with muck, one part turkey manure to two parts muck, one pint to the hill, ...	30 "

Statement of Jabez Fisher.

POTATOES.—My experiment in raising potatoes, which is at the same time an experiment in manuring, was conducted as follows: One-fourth of an acre of ground, consisting of a moderately strong loam, resting upon a clay bottom, was divided into five equal parts. Each plot was manured, as in the table, with seventy-five cents worth of the material, or, at the rate of $15 per acre. The potatoes were of the long, black variety, and of those planted no one exceeded an English walnut in size, while they would average considerably smaller. They were planted, June 12th, in drills, three feet nine inches apart, the potatoes being placed from twelve to fifteen inches distant from each other in the drill. The manure was put in the drill with the potatoes. The ground was hoed but once, and the cultiva-

* The potatoes grown in the horse manure were very wormy, all the other lots were fair, and free from worms.

tion was entirely flat. The crop was dug October 26. The potatoes were large, fair, and free from rot, and the whole crop was weighed.

Lot.	Manure.	Product.	Proportion of small potatoes in bulk.	Product per acre.
No. 1,	Mapes' improved super-phosphate of lime,	735 lbs.	1 in 11	245 bu.
" 2,	DeBurgs' No. 1 super-phosphate of lime,	642 "	1 " 12	214 "
" 3,	Mapes' nitrogenized superphosphate of lime,	603 "	1 " 12	201 "
" 4,	Guano and plaster, mixed in equal quantities,	429 "	1 " 11	143 "
" 5,	Barnyard manure,	417 "	1 " 8	139 "

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statements of Franklin H. Williams.

CARROTS.—The piece of ground on which I raised my carrots is the same piece which drew a premium last year for a similar crop. Two years before (in 1852 and 1853) it was down to grass. The condition of the land in 1854 can be found in the State Report of that year. On the 7th of May the land was ploughed with the Michigan double plough, nine inches deep. I use a seed sower, and a light cast steel plough, which saves me much hand labor in tending the crop.

Expenses:—

Composted manure, twelve cart loads,			$12 00
Carting and spreading manure,			2 00
May 7.	Ploughing half acre,		1 50
" 10.	Preparing land,		75
" 11.	Sowing,		25
June 12.	Hoeing, four days,		4 00
July 6.	Thinning and weeding, five days,		5 00
" 20.	Ploughed with horse,		50
" 26.	Pulling out weeds, one and one-half days,		1 50
Nov. 10.	Harvesting crop, six days' work,		6 00
Taxes, and interest on land,			4 00
Half a pound of seed,			40
			$37 90

Cr.	
By 288 bushels, at 30 cts.	$86 40
Profit, ...	$48 50

The piece contains half an acre. I have reckoned the crop at thirty cents a bushel, or twelve dollars a ton, for which I have sold several tons—reckoning forty bushels to the ton, and fifty pounds to the bushel. Land measured by Deacon Richards.

Potatoes.—The piece of ground upon which my potatoes were raised is of a sandy soil, and not in a high state of cultivation. In 1854 there was corn grown on the piece. In 1852 the ground was covered with blue clay, being drawn in the winter, giving it a chance to freeze and thaw, which lessens the difficulty of getting it pulverized with the soil. The land was ploughed eight inches deep, the last day of April; furrows were then turned, and filled with compost; after the potatoes were dropped, these furrows were turned back, saving at least three-fourths the labor of planting in the usual manner. The piece contained one hundred and seventy-two rods, from which I took two hundred and forty-four bushels, calling sixty pounds to the bushel. Salt and ashes were put in the hill. The variety, the peach blow. Land measured by Deacon P. Richards.

Expenses:—		
Ploughing, $2; furrowing and manuring, $2, .		$4 00
Compost, ...		8 00
Seed, (small potatoes,) 8 bushels, ...		2 00
Planting, 75 cts.; hoeing, three times, $5, . .		5 75
Gathering, 16 days' work, ...		16 00
Taxes and interest, ...		6 00
		$41 75
Cr.		
By 214 bush. of table potatoes, at 50 cts. .	$107 00	
" 20 bush. of small potatoes, at 20 cts. .	6 00	
		$113 00
Profit, ...		$71 25

Turnips.—The piece of ground on which I raised my turnips has been down to grass three years. In July we mowed off a crop of hay. July 10, ploughed with double plough, nine inches deep. The piece contains sixty-eight and eleven-sixteenths rods, from which we took two hundred and seventy-seven bushels. Half the crop is the long turnip, and half the English flat turnip. I use a seed-sower, and a small cast-steel plough between the rows.

Expenses:—

July 10.	Ploughing,	$1 50
" 12.	Preparing the ground,	50
	1½ pt. seed,	20
	8 loads of scrapings, harrowed in,	6 00
	Sowing seed,	50
Aug. 1.	Thinning, four days,	4 00
" 12.	Ploughing between rows, three hours,	50
Nov. 6.	Harvesting crop,	5 00
	Taxes and interest,	2 00
		$20 20

Cr.

By 277 bushels, 20 cts.,	$55 40
Profit,	$35 20

Sunderland.

HAMPSHIRE.

Statement of Nathaniel Smith.

Potatoes.—My potatoes grew on eighty-eight rods of sandy loam or sandy knoll, which bore rye in 1853 and 1854, without manure. Last May, I ploughed in seven loads of coarse manure; and, after two or three weeks, I harrowed it over, pulverizing the soil and destroying the weeds. May 30, I planted about four bushels of Wood's seedlings, and put about eight bushels of ashes in the hills. I hoed twice.

Value of crop:—

135 bushels, at 33 cents,	$44 55

Expenses:—		
Seed, ploughing, harrowing and planting, .	$4 00	
Manure and carting, $9; ashes, $2, . .	11 00	
Interest, $4; hoeing, $3; harvesting, $4, .	11 00	
		$26 00
Net profit, ...		$18 55

SUNDERLAND, Nov. 15, 1855.

Statement of J. Edwards Porter.

CARROTS.—My carrots were raised on five-sixteenths of an acre of rich loam, ploughed ten or twelve inches deep, which had borne carrots for three years. In 1855, I manured with ten loads of earth, that had sucked the juices of the barnyard for twelve months, and with fifty pounds of guano, ploughed in eleven inches deep. I made ridges, eighteen inches apart, with a double mould board plough, and deposited the seed on the top of the ridges with a hand-drill.

Value of Crop:—		
201 bushels, at 40 cents, ...		$80 40
Expenses:—		
Compost, $10; guano, $1.50, . . .	$11 50	
Ploughing and harrowing, $1, . . .	1 00	
Seed and sowing, $1.75; hoeing, $6, . .	7 75	
Harvesting, $8; interest, $3, . . .	11 00	
		$31 25
Net profit, ...		$49 15

HADLEY, Nov. 14, 1855.

Statement of Levi P. Warner.

TURNIPS.—My turnips were grown on fifty-seven and one-half rods of land, which, in 1854, was planted to corn, and sown to clover, at the last hoeing. In 1855, after taking off the hay crop, I ploughed and harrowed it, and sowed six ounces of seed, broadcast, applying a dressing of one hundred pounds of super-

phosphate of lime; and added seven bushels of ashes when the plants were up.

Value of Crop:—		
256 bushels, or 6 tons and 800 lbs. at $6 per ton, .		$38 40
Ploughing, harrowing and sowing, $1; seed, 20 cents; lime, $2.87, ...	$4 07	
Ashes, 87 cents; thinning, 50 cents; harvesting, $3.50; interest, 68 cents, ...	5 55	
		$9 62
Net profit, ...		$28 78

SUNDERLAND, Nov. 17, 1855.

NORFOLK.

Statement of John H. Robinson.

CARROTS.—Herewith I send you a statement of the yield of my carrot crop, grown on one acre and a twelfth of land, as per certificates of measurement.

They are all the orange carrot, and were sown, about the 25th of May, upon ground carefully prepared, by good dressing with good manure, and ploughing twice before ridging; the manure spread after the first ploughing. The entire cost of labor and manure I estimate as follows:—

Ten cords manure from barn cellar, and spreading,	$55 00
Ploughing, twice, ...	10 00
Ridging, and preparing for seed, ...	5 00
Sowing, with hand-sowing machine, . . .	5 00
First hoeing, ...	6 50
Second hoeing, and hand weeding, ...	15 00
Third " " "	12 00
Fourth, " only, ...	3 75
Labor, digging, topping and putting into cellar, .	30 00
Total, ...	$142 25

The entire yield (26 tons 1,375 lbs.) estimated at $12 per ton, ...	$320 25
Net profit on crop of $1\frac{1}{12}$ acre, . . .	$178 00

They were all weighed upon town scales, and estimating forty-three bushels for the ton, would make the measurement 1,148 bushels, or about 1,059½ bushels to the acre. The dry weather in July and August checked their growth and materially lessened the yield; but for that it would, I think, have been much greater.

I have certificates of contents of the lot and weight of the carrots.

DORCHESTER, Nov. 26, 1855.

PLYMOUTH.

Statement of Robert Perkins.

TURNIPS.—The piece of land which I entered for premium on ruta baga turnips, contains fifty rods, the most of it a reclaimed peat meadow. I have carted on to it, in years past, considerable sand, and last fall drained it thoroughly. It was ploughed last spring (for the first time to my knowledge) with a Michigan plough, very deep; it was ploughed again, just before planting, with a small plough. I spread on one hundred and seventy-five pounds Peruvian guano, mixed with six horse cart loads of soil, which had been in pile, mixed together about three weeks, and harrowed the piece well. The 16th of June I furrowed it one way—the rows being two feet apart—and put in most of the furrows super-phosphate of lime, mixed with charcoal dirt; in some, bone dust; in some, ashes; and some were planted without any thing. I think the rows in which were put phosphate of lime and charcoal dirt were the best. It was sown the same day with a machine.

Expenses:—

175 lbs. guano, and carting, ...	$4 82
250 lbs. phosphate of lime, ...	6 25
Two-thirds of a barrel of bone dust, . . .	1 67
Six bushels of ashes, ...	90

Turnip seed, ...	$0 31
Six loads of soil, ...	1 50
Two loads of charcoal dirt, ...	1 00
Ploughing, applying manure, hoeing, &c., . . .	10 75
	$27 20

On the 24th of October, one rod, considered an average one, was harvested, and weighed four hundred and nineteen pounds.

Statement of George W. Wood.

Turnips.—The quarter of an acre of land which I entered for premium for the greatest quantity of French turnips is a clayey loam, and was cropped with Indian corn last year. It was ploughed in April. The last of May I spread seven loads of manure, forty cubic feet each, made from my stock last winter, and ploughed it under, five inches deep. Ploughed and harrowed twice more before planting. I harrowed and bushed until the soil was well pulverized, which, I think, is of great service to any crop, and more especially for small seeds.

On the 26th of June I planted the turnips, first dropping eight loads of compost manure, not very strong, mixed with thirty bushels of leached ashes, and shoveling the whole over until it was very fine, furrowed two feet apart, and put the manure in the furrow. I dropped the seed by hand from ten to twelve inches apart, and covered with a hoe. It was hoed the first time about the 20th of July, and hoed three times afterwards, leaving but one plant in a hill. The turnips grew very fast until the dry weather came on, which caused them to come to a stand. After the rains commenced they grew again rapidly. The turnips are what is called the sugar turnip, the best for table use. I raise them to sell, mostly, which is the reason I plant them so late. I think I s' ould have had a larger crop to have planted them the fore part of June, and a different kind of turnip; but I think the crop would not be worth so much. On the 29th of October, one square rod, considered an average one, was harvested and weighed, when well cleaned of tops and dirt, three hundred and seventy-nine pounds.

Expenses:—

Ploughing, four times,	$1 75
Harrowing, bushing, and furrowing,	1 50
Drawing and spreading manure,	1 00
Planting, $2.50; hoeing and thinning, $6,	8 50
Seed,	33
	$13 08

No charge is made for manure.

CRANBERRIES.

ESSEX.

From the Report of the Committee.

While public attention is much given to the cultivation and improvement of various kinds of fruits, much more is due to the trailing vine,—the history and culture of which are the subject of this communication.

The cranberry, whether wild or cultivated, grown on low or high lands, is fast becoming an element in the profits of agriculture.

It was formerly supposed to be capable of being grown on mossy bogs, swamps, meadows and sand beaches; and though practical culture and recent experiment have partially modified the former theory, it may yet appear that low, wet and sandy lands are best adapted for the successful culture of this desirable addition to the farmer's products.

The cranberry is a small, round, red, acid fruit, sometimes oblong and pyriform in shape, and quite useful and valuable in the culinary department for tarts and preserves. Of late it has commanded adequate and remunerating prices, become more appreciated as a market commodity, and is accordingly receiving (as it deserves) more attention than formerly. Within the present year, it has been sold for $4 and $5 per bushel; though many can remember when, heretofore, it has been sold for $1

and $1,50 per bushel, and rather at these prices a drug in the market.

On the sandy, low necks of land in Barnstable county, it grows wild, and in great abundance, and the people there have, annually, a festival for gathering its fruit. In 1830, in Lincoln, Mass., one grower raised 400 bushels of cranberries. A very successful cultivator near Cape Cod has converted his sand bogs and lands covered with bushes into very productive cranberry beds. His method is simple, and may be easily adopted elsewhere.

First, drain the land, then remove the brush, then plough the land so cleared, and plant the vine. Or, you may haul beach sand sufficient for a heavy top-dressing, and having done so, dig holes three or four feet apart, (perhaps two feet apart each way would be better,) and into these holes insert sods with the vine, which, when planted, will soon spread over the brush and rush, and coat the surface of the ground.

Many experiments have been made to cultivate the cranberry, with more or less success. The experiments and results of them, made by cultivators residing near the sea-shore, are much wanted, and should be communicated to the public.

There are two, well known species, the common American Cranberry, (*Oxycoccus Macrocarpus*,) and the European Cranberry, (*Oxycoccus Palustris*.) There is a plant called the Scotch Cranberry, (*Vaccinium vitis idæa*.) This is not a variety of the cranberry, but belongs to a different genus of plants, as does also the plant commonly called the High Bush Cranberry, (*Viburnum Opulus*.)

The American Cranberry was introduced into England by Sir Joseph Banks, and by him made a subject of garden culture.

Of the American Cranberry there may be several varieties, known by their peculiar shape and color, and all valuable. Whether the intermixture of the plants will vary or improve the fruit, remains to be tested by experiment, and we commend it to the attention of cultivators. The theory of propagation in regard to other plants, may equally apply to this. The pollen of one kind falling on the blossom of another, may so change the distinctive characteristics of the cranberry as to essentially improve the product and multiply its varieties—and those who have paid most attention to this subject at present are of

opinion that there are, practically, but two varieties. Who will say that it may not yet rival, in diversity, character and quality, other well known fruits now in general use? The parent peach of oriental countries had so strong an infusion of the deleterious prussic acid in it, that it was not deemed safe to eat. The pear of the Romans, (according to Pliny,) unless baked or boiled, was "too heavy meat," and yet, in modern times, both peach and pear are delicious desert fruit,—many berries, kindred, in some respects, to the cranberry, are still deemed, and doubtless are, positively poisonous. Yet the cranberry, whether grown on upland or in beach land, is both an excellent fruit for the table and a valuable product for the market.

The many experiments made, and being made, at Cape Cod, Cape Ann, Ipswich beaches, Marblehead, and other places, (if we are fortunate enough to procure the result of these experiments well authenticated,) may yet demonstrate the feasibility of producing new and improved varieties. Our object is to awaken the attention of growers to this subject; and if they have any waste bogs, swamps, or sand beaches, possibly they may find it so much for their interest to improve some of them, by transplanting the vine, sowing its seed, or scattering cuttings in drills or broadcast over the surface, as to be themselves instrumental in discovering and producing new varieties, and originating some new method of cultivating the fruit. At all events, we earnestly commend these suggestions to the agriculturists of this and other counties, not without the hope of attaining beneficial practical results. In this way the great object of all art and science is gradually accomplished. The practical observer collects facts from which the man of science, by logical processes, deduces theories to benefit mankind.

As to cranberry culture, what mostly is needed in growing the vine is moisture. Manure is useless, loam and soil are superfluous—sterile beach sand is better than either. We mean beach sand (sterile for all other purposes) is better adapted to the growing of cranberries than either loam, soil or manure. Fine gravel, if sand be not procurable, will subserve a good purpose. Hence, residents on the margin of the sea, if they have plenty of beach land, can profitably turn their attention to the cultivation of the cranberry. Flowing is almost indis-

pensable in winter or spring. Salt scattered over the land, or salt water submerging the land, improves the berry—rendering it hardier, firmer, and more capable of distant transportation. What it most needs is contiguity to water and air, and next to these, proximity to the seashore. This appears the more probable from an analysis made by Prof. Horsford, and contained in Mr. Flint's Report of 1853. Indeed, without any analysis, facts already known would justify our proposition. At Ipswich, one cultivator grows the fairest fruit where the vine is planted in white beach sand, without any mixture of soil or manure. And the freer the land is of rushes and grasses the better, the cranberry fruit and vine flourish.

The time for cranberry culture may be said to be spring and fall; though, with great care and pains, the vine may be set in August safely, all things else being suitable. If you make cranberry beds by transplanting, do it in the fall. If by sowing seed, or scattering slips, do it in the spring; and May is now supposed to be the best time, although future experiment may yet prove it to be safe to do either at an earlier period of the spring. The time for gathering in fall should be determined by the growth of the berry; gather it when full grown, whether its color be changed or not,—do not wait for it to become red, if thus you must risk the autumn frost or rot. The experience of one of the committee is, that the earlier it be gathered when full grown, the longer will it keep in good condition into the next year. If this shall prove to be correct, it is worthy of consideration, and those having large beds under culture will do a public service by promulgating their experience in this respect. The mode of gathering is by picking or raking,—and which is best depends upon the amount of labor at the disposal of the grower, or extent of surface from which the gathering is to be made. If from a small patch, picking by hand is the preferable mode, and in all cases, where practicable, as by this process the fruit is not bruised. If from several acres, raking is the more economical mode,—saving time, which to the farmer is money, and possibly, securing the crop against an early frost.

To young vines, not strongly rooted, the use of the rake may be injurious, and therefore, in so using it, care should be taken not to disturb the roots. Where the vines are five years old, or more, and strongly rooted, the rake may be usefully em-

ployed in removing the grass and rushes from around the roots, and thus prevent their choking the vines' growth.

When gathered and secured from fall frosts, by whichever process the gathering may have been performed, the fruit should be well cleaned, and all leaves, stocks and rushes separated and culled out, so as to leave the cranberry in a good marketable condition.

The facilities for raising the fruit in Essex county entitle this subject to more attention from the society. A long line of seashore, and numerous bogs and swamps, now lying in an unproductive state, may be profitably converted into beds for its culture. A stimulus is wanted; and that your society can give, by holding out the usual encouragement to meritorious cultivators.

In this report an attempt has been made to establish the following propositions:—

1. That the cranberry can be cultivated, is of value in the market, and therefore worthy of culture.

2. That its culture will convert much at present waste land into a valuable and productive property.

3. That the cranberry most needs moisture, best flourishes in the poorest lands for ordinary cultivation, and delights in beach sand, without a particle of vegetable or animal manure intermixed.

4. That, according to all analogies of science and the great laws of propagation, the cranberry may be improved in character and quality, and its varieties multiplied.

5. That growers should publish the results of their experience and various experiments hereafter made, and should be encouraged so to do by the Essex Agricultural Society.

David Roberts, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of E. B. Fitts.

The piece of cultivated cranberries that is presented for premium contains about twelve rods; it was planted about four years ago; the soil is sandy loam, on the lower part of a pine plain, and had been previously cultivated with corn and rye, until

the crops would hardly pay for the labor of planting and gathering.

The manner of planting was as follows: The land was ploughed about seven inches deep, and harrowed; light furrows, about three feet apart, were run lengthwise; then cranberry sods, of the bell variety, were planted in the furrows, from one to two feet apart.

It came on very dry soon after they were planted, which was about the middle of June, and it was thought that the vines, most of them, were dead; therefore they received no more cultivation; but the next spring they started nicely, and bore a few berries. In 1854,—the season when every thing suffered from drought—the vines were but slightly affected, producing, by estimation, about three bushels of cranberries. The same season we had corn adjoining, on the lower side, which suffered from the drought.

This last spring, (1855,) I put on a small quantity of salt in different spots, which, I think, improved the quantity and quality of the berries very much, and gathered, this fall, about six bushels of very large and nice cranberries, worth $30, while the cost of gathering was but $6, leaving a balance of $24 in favor of the crop.

NORTHAMPTON.

BARNSTABLE.

[By official statistics it appears that there are 3,126 acres of cranberries in Massachusetts. The aggregate value of this crop is returned as $146,074. By far the largest proportion of *cultivated* acres is to be found on Cape Cod.

The writer of the following Essay has inadvertently confounded the species of the cranberry with some of its sub-varieties. There are but two known species of any value belonging to this genus of plants, the American and the European. The latter, though much inferior in size to the former, is often preferred in the London market. The Bell, and other cranberries mentioned, are only sub-varieties of the American cranberry.—ED.]

THE CRANBERRY AND ITS CULTURE.

BY REV. B. EASTWOOD.

I. The Natural History of the Cranberry. The cranberry vine is to be met with in almost every part of the globe. It is most common to those regions of country in which abound the morass, swamp and bog, and where peat or sand form the preponderating portion of the soil. There are some locations in which the vine is found to flourish, but where there is little or no fruit produced. It is in consequence of the adaptation of climate, soils and location, that Cape Cod has the superiority over most places, in the production and perfect development of the cranberry.

The cranberry is found in some parts of Russia, and those who are acquainted with its value make of it an article of commerce. The vine in that country is more stinted and dwarfish in its growth than in this. The fruit is small, and of a pale hue, being much inferior in color to the cranberry raised in Barnstable county. It is exceedingly acrid in flavor, and in consequence of this it can never be a rival to the American cranberry.

The midland counties of England are noted for their extensive fens. These fens are, at certain seasons of the year, flooded, being supplied with water by various little rills which empty themselves therein. On the margin of these rills and fens, grows the cranberry vine, which is a species widely different from the American, and likewise much inferior in size, color and flavor. It is known by botanists as the European cranberry (*Oxycoccus Palustris.*)

The peasantry of the country in which this berry is found do not prize it so highly as they ought. It has never been cultivated in England, and in size, in its wild condition, it rarely attains the bulk of an ordinary pea. It is doubtful, whether if it received the greatest care and cultivation, it would attain the proportions of the American cranberry. (*Oxycoccus Macrocarpus.*)

It scarcely seems necessary to enlarge upon this species, because in this county its merits are so well known. It is

superior in color and size to the Russian berry of the same name; and the English fruit will not admit of being compared with that of this country, because in all qualities by which the perfect berry is known, the *Oxycoccus Palustris* is remarkably deficient.

The American cranberry is divided by dealers and growers into three great varieties. These are, 1. The bell cranberry; 2. The bugle cranberry; 3. The cherry cranberry.

1. *The Bell Cranberry.* This variety is so called because of the resemblance it bears to a bell in its shape. It is the largest, and as dark colored as blood coral. It is by practical cultivators highly valued.

2. *The Bugle Cranberry.* This variety somewhat resembles a bugle bead it its form, being elongated and approaching an oval in its shape. There are two sub-varieties, one large and the other small, by some cultivators preferred.

3. *The Cherry Cranberry.* So called from its similarity in shape, size and color, to that well-known fruit. It is of two kinds, the large and small. Some cultivators value this variety more than any other. The vines on which these varieties grow are found in their natural condition around the margin of swamps, and sometimes in the interior, on the tufts and elevations which are often to be met with in them. In their native condition, neither the vine nor yet the berry attain that degree of thriftiness, beauty and size, which they are seen to reach in the yards of the Cape Cod cultivators.

II. The Early Cultivation of the Cranberry Vine. Many years ago the attention of an old citizen was called to the vine which he found growing in a swamp which he owned. It occurred to him that it might be cultivated, and accordingly he attempted to aid nature in developing the cranberry. Those efforts were attended with partial success. Others tried to do something on a small scale, but soon became discouraged. About fifteen years since the cultivation of the cranberry received more attention than it had previously attracted. Some individuals found the vine flourishing on the margin of ponds or in the midst of swamps. Some discovered them abounding on sand and others on peat. The various situations in which the vines were found led to various opinions; one supposed

that a somewhat dry location was suitable; another, a damp soil, or one that was constantly saturated. And in reference to soils, it was said that sand was best, and then that peat was superior, and that loam was desirable. The variety of opinions which existed at that time led to a variety of experiments; some were attended with success and others failed.

But it is within the past ten years that the attention of agriculturists has most particularly been called to the cranberry vine. And in that time more has been done on Cape Cod, to study the nature of the vine, and what are its wants, and to bring it to a state of perfection, than in any previous period. And it is just to state that its cultivation in this region is now so well understood, that individuals can soon determine the location in which the vine will flourish.

In the early days of cranberry culture men had to meet with difficulties which arose from the want of experience and knowledge. Now that both have been obtained, it accounts for the greater success which attends the efforts of practical men. And in no region, either in this or any other country, is this so well understood as on Cape Cod.

Persons who undertake the culture of the cranberry, who have not taken pains to collect information in reference to the management of the vine, will meet with the same difficulties which beset the early growers. But this need not be the case, because the advantages of ripe experience can be had by seeking it from the best and most reliable sources. And he who can obtain this will avoid those obstacles and consequent failures which have been so common.

III. Proper Locations for Cranberry Yards. At the present time there is a difference of opinion existing as to whether uplands can be made available for the economical cultivation of the vine. Efforts have been made to naturalize the vine to those situations, and a degree of success has attended them. There is this to be said of upland locations, that if there is an absence of moisture from the soil in the summer season, the vines cannot live. In uplands where any success has been met with, we are convinced that there must be a good degree of moisture, and that frequent stirring of the soil is called for, in order to keep it so porous that it will freely admit the moisture

of the atmosphere. We have seen such locations tried on Cape Cod. Most of the vines died. Some few lived and bore a little fruit. The gentleman who tried this experiment, says: "If I had hoed them as I did the vegetables on my farm, I believe I should have succeeded; I mean to try again."

Places in which stagnant water has been found, have been tried by some cultivators. But the scum or slimy moss which has been generated in such locations has injured the vine. In consequence of this they are often avoided in selecting a desirable location.

Obtain, if possible to do so, a southern aspect. The vine has been known to do well in northern situations; but it is admitted by the most experienced cranberry growers, that a southern aspect is best. A sheltered position is a favorable one, as it protects the vines from the fierceness of the weather.

Swamps on the Cape have been frequently chosen as the best locations for the cultivation of the vine. It is true that these hitherto useless places have been turned to good account. It is believed that the greater number of swamps on Cape Cod have a similarity of soil, and if this be a fact, and some of these swamps have been converted into cranberry yards, and they have done well, by paying remunerative profits, then why not make good use of the rest by a similar application? Cape Cod, in this respect, abounds with good locations for the cultivation of the vine.

Meadow lands which are low and moist, afford excellent locations for the cranberry vine. In fact, these damp situations are very suitable, providing the dampness or moisture is not too cold and icy. Many of the yards on Cape Cod are on locations of this kind, and they are found to be good.

Gradual descents from a hill or upland to the margin of ponds are in some regions highly prized. Such locations have been proved to be available for the advantageous culture of the cranberry vine. These are numerous in the county of Barnstable, and we may yet hope to see them improved by being converted into cranberry yards.

Sheltered and protected positions are sought after; these are situations in which the vines are not likely to meet with the force of the hardest and stormiest weather. On this account they are valued much by the cranberry cultivator.

It is becoming common, on Cape Cod, for those who are going into the extensive cultivation of the cranberry, to select sandy plats of land, which are to be met with along the seashore. These are only protected from the encroachments of the ocean by the high banks, which give to the land below the appearance of a small valley. Recently, Mr. Crowell, of New York, has purchased eight acres of land of this description, in Wellfleet, which is to be prepared and planted over with the cranberry vine. It appears that these hitherto barren wastes will yet, on Cape Cod, be made a source of wealth to those who know how to take the advantage of their adaptation to produce the cranberry. We know of no part of the world which possesses equal facilities, natural and acquired, with Cape Cod, and her inhabitants, for the cultivation of this famous fruit.

If we consider the soils which are to be found on Cape Cod, it will be seen at once, that in this respect we are highly favored. Our beach sand and peat are proved to be the best soils for the perfect development of the cranberry. From Barnstable to Provincetown there are tracts of land, and swamps, which, so far as the question of soil is concerned, are all that could be desired. And these can, at a moderate expense, be appropriated to the cultivation of the cranberry. It seems, at present, that Cape Cod is destined to be the finest cranberry garden in the world.

IV. Vines claim a Passing Word. It is somewhat difficult to distinguish between healthy and unhealthy vines. Even the most experienced are liable to be deceived in the selection of vines in the winter, if they know not how they bore in the summer; they are almost as sure to be misled as one who is just about to begin the cultivation of the cranberry.

The barren vine appears stouter; and stronger than the fruitful one, their spears are thicker than those which produce the most fruit. This strong and healthy appearance of the vine, by some, is regarded as a sign of their barrenness. In selecting vines for transplanting, there is one of two courses which can be followed to advantage: First, confidence in the individual of whom we purchase. If he is a trustworthy person, his word can be taken, and he would feel no pleasure in deceiving even

the most ignorant. The second method which may be adopted with confidence is, to visit those yards from which we intend to purchase, at those parts of the year when the vine is blossoming, or the fruit is developed. In seeing them at such seasons the intending cultivator may protect himself against imposition. Without either having one or the other of these advantages, even the most experienced are liable to be mistaken in the quality of the vines they buy. The healthy vine, by some cultivators, is stated to be of medium thickness, or strength of spear, and bushy leaves. All the barren vines which we have examined are stouter and stronger in appearance than the yielding ones.

V. Planting Vines. In removing the cranberry vine from its native bog, or even from the yard in which it is cultivated, we believe that all prefer to have it remain there until they are prepared to plant or set out—though some say that the vine will not suffer if it is taken out of the soil and put in a damp, warm cellar, and kept there through the winter months; yet the former method is most generally followed.

The time of planting is wholly to be determined by the advantages which are possessed by the cultivator. If he can flood the ground which is to be planted over, then fall planting is preferred and recommended. We can, in support of this, quote the opinions of many successful cultivators on Cape Cod, but deem a mere reference to one or two names as sufficient, under this head.

Spring planting is best to be followed, by those who cannot flood their locations. Because, if they planted in the fall, and were not flooded, they would be thrown up out of the soil by the frost. Experience has taught, that in the spring, say in May or June, vines may be planted to better advantage than in the fall.

The methods of planting are various. These we will, briefly as possible, enumerate:—

1. *Sod Planting.* This is the oldest plan, and some adhere to it with great tenacity. In planting the sod on which the vine was found, it was liable to produce grass, weed, and foul stuff, which filled up the yard, and thus retarded the thriftiness of the vine.

2. Separating the vines from the sod, and freeing them from

weeds, &c., is esteemed by many as an excellent method. When these vines are divided, and planted at proper distances, and are watched for two or three years, and the weed is kept down, they are found to do well. Some prefer this method to every other.

3. *Cutting Planting.* In pursuing this method, the vine is obtained and cut up into convenient lengths, say from four to six inches. One of these cuttings is taken, but not planted with the end down, and one end out of the soil. It is planted in the middle of the cutting, leaving up both ends, so that, when it takes root, instead of there being but one runner, there are two. This is a good and safe method.

Cutting planting may be continued in another form. Take two or three cuttings or slips, about three or four inches long, and force the lower ends into the soil with a dibble—each slip will take root and form a vine. This has been tried with success, and in some parts of the country it is a popular method.

Broadcast Planting. When the vines are procured in sufficient quantities, they may be cut about two inches in length, and that by a common hay cutter. When the ground is prepared to receive them they may be scattered over the surface, as is wheat or oats, and then well harrowed into the soil. The cuttings will take root from the base of the leaves, and will soon spring up, and present the appearance of young and healthy vines. Some prefer to bury these cuttings in drills, but it is mere matter of opinion as to which plan is best.

Propagation from the Berry. This is not a safe method. Many who have tried it have decided that it cannot be followed by a cultivator with any advantage; therefore it is not recommended.

Distances, in planting, are wholly regulated by the extent of ground to be covered, and the quantity of vines at the cultivator's disposal. But, on Cape Cod, we believe that eighteen inches is the distance preferred. The reason for this is obvious; the yard will mat the sooner.

VI. Treatment of Young Vines. Cranberry vines, in their cultivation, do not require that amount of labor and care bestowed upon them which is demanded by some other horticultural plants. Yet those who do attend to the vine, by weeding

and hoeing when necessary, will find that their vines will succeed much better by being so treated. Where the land is hoed upon which the cranberry is planted, it is chiefly the upland; and this is done with the view of making it porous, so that the soil will readily take in the moisture of the atmosphere. It is the opinion of some cultivators that, if the yard in which the vine is planted is hoed for the first two or three years after it is set out, it will be more thrifty, and consequently of more profit to the proprietor.

VII. The blossoming time of the cranberry is of some importance, and it being so delicate and sensitive, it calls for precautions to be taken, in order to preserve the flower from injury. These precautions are required more in some regions of country than in others. Such districts as are liable to be visited by frost at this season call for especial care. And it is here that the advantage of flooding appears. Those who can do this can keep back the blossom until such times as they believe that the frost has disappeared. This is the only thing that can be done to preserve them from destruction.

VIII. Like every other plant, or fruit vine, the cranberry is subject to certain drawbacks, arising from two or three causes.

1. *The Vine Worm.* We have not seen this enemy of the cranberry, and have only met with one gentleman who has. He describes it to be about the eighth of an inch in length. It has been sought after with extreme care and diligence, but its presence seems only to be known by the devastation it commits. And so great and fearful are its ravages, that vines which have been attacked by it will, in a night, seem sickly, and the crop will be cut off. Not having seen this insect, which is such an enemy to the cranberry vine, and not being able to obtain an accurate description of its form and size, even from those who have suffered most from its ravages, we are therefore unable to identify it with insects which are the known enemies of other fruits.

This insect attacks the vine in a very peculiar manner. It does not attack the growth of the year previous to its coming, but it begins its operations from the base of the new growth of that year in which it makes its attack. It works upward. It

seems to settle itself under the young leaves, and after having feasted upon the vine, it webs it up, and leaves upon it the appearance of "fire blight." This insect appears, generally, soon after blossoming, and often attacks certain sections of the cranberry yard, and leaves the other unvisited.

2. *The Cranberry Worm* is that which destroys the berry. Flooding is often resorted to to prevent this; but we believe no effectual remedy has yet been discovered, and applied against this "fruit worm."

3. *The Rot.* This is not so common as the former causes of destruction to the cranberry, of which we have briefly treated. We have seen but one yard in which the cranberry rotted, and then this rot was confined to one particular part of the yard. The proprietor believes it to be too low, and that if he raised it to the level of the other section of his yard, it would correct this evil. The opinion of another experienced cultivator is, that the vines are too thickly matted, and consequently they cannot receive the rays of the sun as they demand, nor yet air in sufficient quantity to meet their wants. If the rot arises from either of the causes named, the remedy is easy to apply.

IX. The cranberry is a fruit which every year is increasing in value, from the fact that the demand for it is now greater than it ever was. We would not speak disparagingly of the cranberry raised in Maine, New Jersey, or the South; but yet, on a careful examination of their products in this department of horticulture, we are compelled to award to the cranberry of Cape Cod the highest praise. The cranberry raised in the county of Barnstable is deep colored, large and hard. It will keep well when properly treated, from harvest to harvest, and it does, most certainly, stand higher in the great markets of this country and Europe than any other fruit of the same name. The soil, climate and natural facilities of the Cape are conducive to the perfect development of the Cranberry; and as its cultivation is yet in its infancy, we may hope for our county to become the great cranberry garden which shall supply the world.

We might extend this paper to a greater length than is desirable, by alluding to the magnificent yards which exist on the

Cape, producing at the rate of two or three hundred bushels to the acre, and returning to their proprietors handsome profits; but this is unnecessary, as the fertility of the Cape Cod cranberry yards is known in all parts of the civilized world. In concluding this article, may we be permitted to express a hope that the subject upon which we have been treating will meet with earnest attention from the cultivators of the soil on Cape Cod.

FARM IMPLEMENTS.

MASSACHUSETTS.

Report of the Committee on Mowing Machines.

The undersigned, being a committee appointed by the Society to take charge of the subject of a premium of six hundred dollars, offered by the Society "to the possessor of the mowing machine which shall cut, during the present season, with the greatest economy and to the best advantage, not less than fifty acres of grass within the State, the machine to be worked by horse or ox-power," beg leave to report:—

Immediately upon their appointment, they issued a printed circular, offering the premium with the condition attached to it by the Trustees. They likewise invited the County Agricultural Societies to assist them in their duties by observing the work performed by the competitors within their districts. They also prepared a blank form of return, which was sent to each competitor, with a view of obtaining a uniform return upon all the points deemed to be necessary in making up their award, and also such information as might prove useful hereafter, both to farmers and to the manufacturers of machines; copies of each of these documents are herewith appended.

Forty entries were made for competition within the time limited by the trustees; of these, but sixteen complied with the conditions by making a return of their work before the tenth of September. Of these, Mr. Lyman desired not to be considered a competitor, making his return only for the purpose of

adding to the general information sought for by the trustees upon this subject. The return of the Hon. Josiah Quincy came too late to entitle him to claim the premium; but it is recorded with the rest as a valuable addition to the knowledge sought for by the committee, as also his remarks, a portion of which will be found in the Appendix.

It was originally proposed that the labor of supervising the work of the competitors should be divided among the members of the committee. It was soon apparent, however, that this method would not give them that knowledge of the comparative merits of the competitors, which was absolutely necessary in the final award of the premium. It was therefore arranged that one member should visit each competitor and examine his work, thus creating one general standard by which the whole should be judged. Mr. Lincoln undertook this extremely laborious task, and the report of his observations is herewith submitted for your examination.

Much good, although some misapprehension, has arisen from County Societies having appointed public trials of mowing machines, connecting them with this premium offered by the trustees of this Society. This has been caused, in part, by the fact of the premium offered for the *best mowing machine* to be awarded in 1856, and partly from the great interest which has sprung up among the farmers in relation to the subject. These trials, although interesting and instructive in themselves, have had no weight or influence in making up their award. The committee have directed their attention singly to the work done, and to the skill and economy with which it has been accomplished. They are fortunately relieved from passing any judgment upon the comparative merits of any particular patent or the work of any manufacturer at this time, because they have seen no machine as yet, which, in their opinion, is not capable of very great improvement; and they feel confident that by the coming year, we shall see many modifications which will add to the efficiency of the instrument, and (the committee hope) much better workmanship than has thus far been exhibited by the makers. The field is still open for the patentees and manufacturers, and every effort will be made that a fair trial shall be had to determine whose machine is the best, as there has been

this year, to determine who has shown the greatest skill in the management of those now in use.

The returns of the competitors, (an abstract of which is herewith appended,) furnish much useful information. They establish conclusively, that machines can be used to mow with advantage a much larger range of field, as to quality and condition of land and grass, than one would have supposed to be possible at this early stage of their introduction. Rough land covered with stones, hilly and broken surfaces, reclaimed bogs, salt marsh, all seem to have been brought under the dominion of the machine, with as few casualties to it as usually fall to the common scythe. At the same time the returns show with equal clearness that the farmer will gain in the end, by putting his field into better condition for the use of the machine; and it is to be hoped that one consequence of their introduction will be clearer and better ordered fields, and the removal of stumps and stones that have been too long an eye-sore and a disgrace to many of our farms.

The returns in detail show how minute the sub-division of our farms has become from the smallest of the fields cut over, not averaging, with the exception of the river bottoms, four acres. These small fields are great impediments to good farming in every point of view, and particularly to the use of machinery moved by oxen or horses. It would not be too much to say that one field of twenty-five acres can be more cheaply and better cultivated, and with a better pecuniary result per acre to the farmer, than twenty acres cut up into three, four or five lots.

The time employed in cutting with the machine is of considerable importance in reference to its labor-saving properties; and if we were confined to the returns themselves, it would be impossible to decide how far this economy has been carried. Some of the competitors have doubtless deducted for all stoppages; that is to say, they have made an exact return of the time during which the machine was actually in motion, while others have counted from the time when they commenced work to the moment when they finished, without deducting for stoppages to rest and repair. Nearly all the competitors, however, have cut a measured half acre before Mr. Lincoln; the average of the time being about twenty-two minutes to

the half acre. The land selected for these trials was equal, if not better, than the average, and the horses were driven as fast, at least, as they were accustomed to be worked. This would therefore prove that a fair average performance of a machine would be for cutting one acre, forty-four minutes; whether a pair of horses could continue this rate of work for any great length of time is not so certain; but the facts before us and our own observations lead us to believe that an hour per acre would not be an overtask for horses, including all ordinary stops, and that a pair of horses could continue the work so as to cut, without undue exertion, from ten to twelve acres per day.

The time table as presented by the competitors, is evidence of the value which they attach to speed, and too much haste has in consequence shown itself in the work performed. The machine has, in too many instances, been dragged over without cutting the grass, for want of time to permit the knives to operate, and a mane of grass has been left between the swarths in the endeavor to get the full benefit of the cutting bar. The competitors have nearly all erred in these respects; but the fields of Mr. Lyman, which, since he has withdrawn from the competition, we feel no hesitation in speaking of, present a complete exception, affording a beautiful illustration of even and correct speed, and evincing no common judgment and skill in the operator of the machine. We allude to this for another reason, from the fact that the operator had never before worked or seen a machine at work; the important truth is established that it requires no apprenticeship to work a mowing machine, but that it is at once a useful instrument in the hands of any one possessing a fair amount of judgment and discretion.

The returns are uniform in their testimony as to the ease with which the horses have performed their work. They have been generally of light weight, not averaging more than 1,050 pounds, and they have gained in flesh during the season's work, several of the competitors cutting from sixty to ninety acres, and doing all the raking, carting, and other usual farm work.

The accidents which have been recorded by the competitors have been much fewer and slighter in character than it would have been thought possible in fields not properly prepared for the machine, and they have generally been repaired upon the spot, and they have too often been the result of imperfect work-

manship. A nut should never get unscrewed or a finger, pin, or pole break, unless some great violence is done to the machine by the unskilfulness of the operator. Yet all these accidents have occurred without any apparent good reason, in too many cases. The remarks of the competitors upon this point are well worthy the attention of the makers of mowing machines.

There is another gratifying fact which has come under the observation of the committee, and which they deem worthy of mention, and it is this, that the better and stouter the grass, the more perfect has been the working of the machine, in all respects. This is another inducement to better cultivation, which, it is to be hoped, will not be lost upon farmers.

We come now to the delicate and difficult question, To which competitor or competitors shall the prize be awarded? In order to arrive at a conclusion, satisfactory to ourselves, we have made an abstract of the returns, and have given to each competitor credit for what he has done, taking time, quantity, quality, and economy of work into each account. We have also had the benefit of Mr. Lincoln's report upon the performances of each competitor, and have deduced from it, as well as we could, the comparative excellence of the work done. We have also been aided by the reports and the observations of county societies and committees. It will be borne in mind that the trustees, in offering the prize, reserved to themselves "the right of dividing it among equal claimants." This, fortunately, relieves the committee from a very great embarrassment; for it is impossible for them to determine which, of two competitors, stands the first. All other things being equal, the highest number of acres cut would have settled the question, but this is not the case, no two things being equal—each having a superiority, in some points, over the others. They recommend, therefore, that the premium of six hundred dollars be divided, in equal sums, and paid to the following competitors: MARCUS BARRETT, of Auburn; SAMUEL PARSONS & SONS, of Northampton. Accompanying the return, there have been several letters and communications addressed to the committee, by competitors and others, portions of which are annexed to this report, as bearing upon points about which it was the design of the trustees to procure information.

The committee have received the ready and cheerful co-operation of the county societies, whose services have been rendered in a most liberal spirit. They have likewise been met by the competitors in the best feeling, and with an earnest desire, on their part, to do all in their power, not so much to gain the premium offered, as to test the value of the mowing machine as a labor-saving implement. They cannot, therefore, take leave of the subject without an expression of thanks to all who have been engaged in the competition, and to those who have assisted them in their labors.

All which is respectfully submitted.

THOMAS MOTLEY, Jr.,
GEO. W. LYMAN,
CHARLES G. LORING,
RICHARD S. FAY,
WM. S. LINCOLN,
Committee.

General abstract of the returns of the competitors.

Number of competitors,	17
do. acres cut,	1,457
Hours occupied in cutting,	1,067
Average time per acre in cutting, minutes,	44
Number of horses employed,	34
Average weight,	1,029
Fingers broken or lost,	93
Knives,	18
Pins, screws, bolts,	17
One track clearer broken,	1
" pole,	1
" axle,	1
" iron brace,	1
" crank,	1
" cog wheel,	1
	134

To the Committee on Mowing and Mowing Machines of the Massachusetts Society for Promoting Agriculture.

The undersigned, one of said committee, presents this report of an examination made by him of the machines used, and the land mowed over, by the various individuals, competitors for the society's premium.

Proceeding to the western counties, the subscriber first visited the farm of Mr. Noble, in Pittsfield. This farm was in the valley of the Housatonic, and was composed in part of hill, and in part of "bottom" land.

About twenty-five acres of land had been cut over, covered with clover and the English grasses. The clover field was not examined, as Mr. Noble had been compelled to substitute scythe for machine mowing, owing, in part, to the loose character of the soil, and partly to the grass being badly lodged.

The work upon the land covered with the English grass, was not well done. Long, and in some spots, not narrow ridges of uncut grass indicated where the driver had failed to make his machine point out; and the whole appearance of the field was any thing but satisfactory.

Mr. Noble was subjected to a trial of mowing, by the undersigned, upon a piece of bottom land, of four rods by twenty, where the grass was that which is natural to such lands, standing thick and short and being fine and somewhat difficult to cut.

The result was unsatisfactory. The machine had been stopped a number of times, to remove the mown grass from the knife-bar, upon which it had accumulated, and upon an examination of the land, after portions of it had been raked, it was found not to have been well or closely cut.

In justice to Mr. Noble, it should be stated that he had never, till the present season, seen a mowing machine, nor, in the opinion of the undersigned, was his driver at all acquainted with its proper management. The machine, although having done but little work, was not in good condition, the knives, especially, showing hard usage, there being some broken ones upon each bar.

Like all other competitors, Mr. Noble was cautioned in the outset to show how well, and not how quickly he could do his work. The whole time occupied in cutting the half acre was thirty-five minutes, inclusive of stoppages, of which there were six in number, and the number of swaths was twenty. The width of knife-bar was four feet, and the weight of horses, with harnesses on, 1,850 lbs.

The grass in Berkshire county not being as yet fully grown, and one of the competitors being unprovided with a machine, the undersigned assented to an arrangement proposed by Mr. John Wilkinson, and Berkshire county was left to be revisited at a later date.

Proceeding to Hampshire county, the undersigned reached Northampton, and in company with Paoli Lathrop, Esq., one of the Hampshire County Society committee, at once visited the "meadow," where he had learned the various resident competitors would be found engaged in their work. S. Parsons & Sons had entered as competitors. The machine was in charge of the son, Mr. Joseph Parsons, who exhibited a high degree of skill in its management. Mr. Parsons had cut some eighty acres, and all of it, upon examination, proved to have been well cut.

Mr. Parsons was also subjected to a trial of his skill upon a plat of four rods by twenty. The surface of the land was smooth, bearing a fair burden of herds-grass, with but little of the finer growth usual at the bottom. The mowing was done smoothly and evenly, without interruption of any kind, in seven and one-fourth minutes, the cut of the machine being five feet and four inches. His machine was in fine condition. Mr. William Strong was visited, but he had concluded to withdraw from competition. The machine of H. W. Parsons was at work in charge of the young man. Some thirty-five acres had been cut over, but no account of the number of days, the number of hours in any one day, and in fact none but guessing account of any thing required in the trial could be given.

Mr. Parsons was informed that no notice could be taken of work done so loosely; but that he could compete without taking into account the work already executed. Mr. Parsons, after a night's reflection, determined to abandon the trial.

Various machines, in the charge of other individuals, were in use upon the "meadows," but the work done by these gentlemen was not of so good character as that of Mr. Parsons.

An exception, however, should be made in favor of a lot of land mowed by a young lad named Henry Graves, to the very great excellence of whose work I am glad to have opportunity of bearing testimony.

Mr. John A. Morton, of Hadley, upon being visited, announced his determination to withdraw from the competition.

Mr. Levi Stockbridge was found on his farm, in North Hadley. Possessed of the requisite determination, he gratified the undersigned by complying with his request to attach his horses to his machine and exhibit its powers in working, in the midst of a soaking rain. The ground chosen for trial was slightly rolling, with a smooth surface, bearing a burden of fine grass, thick set, but of short growth. Notwithstanding the grass was perfectly saturated with water, Mr. Stockbridge cut his lot of one-half of an acre well and smoothly in twenty-five minutes. The machine was stopped but once during the trial, and that in consequence of having cut through a mound of loose earth. This trial was harder than any other competitor had been or was subsequently subjected to, and tends, in a great degree, to disprove the oft-repeated assertion that mowing machines can run only in perfectly dry grass.

Mr. Stockbridge's horses weighed about 1,800 lbs., and drew his machine, cutting four feet, with apparent ease.

About forty acres of land had been mowed, some bearing the coarse, tall, stiff rye, and others finer grasses, natural to the Connecticut bottom, and other parts covered with the clover and herds-grass incident to land subject to the plough. Upon a second visit, upon the 23d of August, an examination was made of other lands mowed by Mr. Stockbridge.

One field, containing, in the judgment of Mr. Strockbridge, some twenty-five acres, about eighteen of which, as was thought, had been mowed by the machine, gave evidence of the power of the machine, and of the skill, and patience, and perseverance of this competitor. The surface of the land was very broken, and dotted, in some places closely, with stumps. The swaths ran from the gravelly knolls to the spongy meadow, covered with water, and the limber yet wiry, fine grass, of half-swarded

hill side, lay mixed with the coarse yet softer grasses of the swale.

It was a place where hardly any thing save, the maniâ, *â mowing machine*, would have dared to venture; yet this spot, as in fact all others, gave proof of the superiority of machine over scythe mowing. His machine showed marks of very hard usage.

Mr. Thomas J. Field, of Northfield, in the county of Franklin, was next visited.

The examination of the land mowed by Mr. Field, about sixty acres, was made in company with Charles Pomeroy, Esq., a member of the Franklin Society's committee. The varieties of grass usual to cultivated land had been cut. As a whole, the surface over which the mowing had been done, was smooth, and the work had been generally well done, though not so satisfactorily as in some other instances.

Mr. Field was subjected to a trial upon a smooth and level plot of four by twenty rods, bearing an average burden, principally of herds-grass, with some fine grass at the bottom. His machine, cutting a swath of five feet and four inches, was under the management of Mr. Walter Field, and the work was done in seventeen and three-fourths minutes.

The mowing was good, as a whole, the only failure being in pointing out.

Upon a subsequent visit to Mr. Field, on the 22d day of August, an examination was made of much of the land which had been mowed by him subsequent to the time first named. The lands which had been cut over were principally in the Connecticut bottom, the surface generally undulating, and in places broken by abrupt swells. In the opinion of the undersigned, the work was not so good as the first, after making the allowance proper for the difference in the surface of the land and the kind of grass to be cut. Still it was better cut than a gang of hands would have done it.

Mr. Field had cut over about one hundred and sixty acres, and in the execution of this work his horses had gained sixty-eight pounds in weight.

The first farm visited in Worcester county was that of Walter Bigelow, Esq., of Worcester.

Mr. Walter Bigelow, Jr., had, in person, charge of the ma-

chine, and the appearance of the land named gave abundant proof of his skill in its management. Mr. Bigelow's land is hilly, the surface of most of it had been previously prepared for the machine, though in many places it was not smooth, and upon the swale land Mr. Bigelow had driven his machine among trees and over rocks and hammocks. The comparison of scythe mowing on one part with machine work on a different part of this portion of the farm, resulted favorably to the machine.

The mowing of Mr. Bigelow, about fifty acres of land, was above the average of the work which has been examined.

Marcus Barrett, of Auburn, was next visited. Mr. Barrett had used his machine principally upon the farms of some of his neighbors. The land mowed over was hilly, and more obstructed by stones, rocks and trees than any which had fallen under the notice of the undersigned. The appearance of the fields showed that Mr. Barrett was possessed of a remarkable degree of skill. It was difficult, and on some fields impossible, to detect upon the surface of the land the point of junction of the various swaths, and throwing out of account the uneven surface of the land, the numerous obstructions to the fair operation of the machine, arising from the rocks and trees, the mowing of Mr. Barrett is unapproached; so smooth, clean, even and beautiful mowing has been nowhere else seen by the undersigned.

Mr. Barrett was revisited by me at a subsequent period, on the occasion of a hasty visit of one of my associates to Worcester. An examination at this time, of the land previously mowed, as well as of a small plat cut by Mr. Barrett during this visit, confirmed the opinion just expressed.

Whether the *quantity* of land mowed has been sacrificed to the *quality* of the work done, the undersigned has no means of ascertaining. Mr. Barrett had been previously subjected to a trial of his skill by the county committee, at which the undersigned was present. Upon a smooth bottom of mostly redtop, Mr. Barrett had cut his lot of four by twenty rods in eighteen minutes, with a machine carrying a knife-bar five feet and four inches long. The quantity of land cut over by Mr. Barrett was about sixty acres.

Mr. M. M. Hovey, of Sutton, was next visited. The mowing of Mr. Hovey had also been done upon hilly land, though the

surface was somewhat smoother than that of Mr. Barrett and equal to that of Mr. Bigelow.

The operation of Mr. Hovey's machine, cutting four feet and eight inches, was witnessed from a distance, and the land mowed subsequently passed over and examined. The land was not favorable to the operation of the machine, and the work did not come up to the standard of the other mowing of this competitor. The day was close, and the horses showed marks of having been pressed beyond their natural walk. Mr. Hovey was not subjected to a trial, because, in the knowledge of the undersigned, he had already been subjected to an exhibition of his skill by the county committee.

As a whole, the work of Mr. Hovey was well done, though it seemed to the undersigned as if, in places, there had been too much attention given to the speed at which the work should be accomplished.

In a pouring rain, on the afternoon of this day, Mr. George C. Davis, of Northboro', was visited. Like a good farmer, as he is, Mr. Davis was found in person getting in his hay. Mr. Davis had completed his mowing, and the undersigned had no opportunity of seeing the machine at work under the management of this gentleman.

Such examination of the fields of Mr. Davis as a driving rain of three hours would permit, was made. Most of the land cut over was the smooth land of the plains, having a fair burden of grass, and offering no obstacle to the uninterrupted progress of a good mowing machine. As a whole, there was a manifest superiority over hand work, yet, considering the advantage Mr. Davis enjoyed in the smoother surface of his fields, his work was not so good as that done by some other competitors.

On the 27th day of July, the farm of Mr. Buckley Moore, in Framingham, was visited. Mr. Moore had cut, and well cut about forty acres of his own land and that of his neighbors. The land was light, slightly undulating, bearing a moderate burden of what is called old field, where redtop is the grass predominating. In the trial to which Mr. Moore was subjected, the plat of one-half an acre of land, smooth surface, bearing a light burden of fine grass, was well cut in twenty-six minutes. The length of the knife to the machine of Mr. Moore was four

feet and eight inches. The horses weighed more than any pair seen at work, coming up to 2,573 pounds, and as perhaps would be expected, they were slower workers than any others.

From Mr. Moore's, the next step was to the farm of Dr. W. T. G. Morton, in West Needham. Upon the fields of his neighbor and the land of his own, Dr. Morton had cut over about sixty acres. The land was generally light plain, level, having a smooth surface, bearing a moderate crop of light, flexible grass. On some fields there was a heavy burden of herds-grass. As a whole, the mowing was well done; but upon some fields marks of bad management were visible. More particularly was this seen at the turns of the swaths, where the team had been driven so as to make a round instead of a square turn.

A piece of land, four by twenty rods, upon a moderately smooth surface, lately seeded, yielding in places an unusually heavy burden of grass, was selected as the place upon which the trial in this instance was to be had. The afternoon was cool, with a light breeze from the north. With a machine cutting four feet eight inches, drawn by a heavy pair of horses, the half acre was cut in seventeen swaths, occupying seventeen and three-fourths minutes only. The speed of the team may be judged of from the fact that no one of the three individuals using a knife-bar eight inches longer, and making four swaths less, the whole length of the plot, consumed less time in cutting the same surface of light grass.

Some time was lost, and should be deducted from the above, in removing the grass which once wound upon the small gear, and which, at the corners of the lot, turned at right angles, more than once caught upon the ends of the "fingers" or knife-guard.

The trial was not satisfactory; the work was not so well done as upon the fields cut by the same machine run by the same competitor, nor did the mowing of this individual come up to the average of that done by others. An exhibition of one's skill in managing a machine is not promoted by a show of the speed at which it can be driven, nor does any one show "*how well he can mow*" by an exhibition of how fast he can drive. Justice to Mr. Morton requires that I should state that his machine was in bad condition. It had been intrusted to the

hands of a common laborer, who had apparently paid little or no attention to the condition of the implements of his labor.

Mr. G. W. Williams, of Taunton, was next visited. This gentleman had finished his mowing, having cut over some thirty-five acres. His work was principally in one large field, its surface level and smooth, save from the "dead and ridge furrows" of former ploughing.

Mr. Williams expressed great satisfaction with this, to him, novel method of mowing, expressing a confident belief that he had effected a great saving of grass, as well as labor, by substituting the machine for scythe work, and although the undersigned is not disposed to controvert this position, he feels constrained to say, that the saving of grass was not so great as he had found upon other fields, nor was the appearance of the field so uniformly good as from the surface of the land and the quality and burden of the grass it should have been.

Upon inquiry of the officers of the county society, assurance was given that Mr. Rodman, of New Bedford, was not a competitor; and therefore no visit was made to the farm of that gentleman.

Reaching Salem, in Essex county, the next day, an arrangement was made with the committee of the county agricultural society, to join them at a subsequent day in the examination of the work which had been done in that vicinity.

Proceeding to Newburyport, the undersigned learned to his regret that Mr. Winkly, of that place, had not engaged in the competition for which he had entered, and after an examination of the fields of Col. Newell, and others in Newbury, which had been mowed by Mr. W. F. Porter, of Bradford, he returned to Salem, joining the Essex county committee. The farm of Mr. H. Ware, in Marblehead, was first visited. A portion of Mr. Ware's mowing was well done, although there were more numerous proofs of defective cutting than had been found upon the land of any other competitor. This was more particularly the case upon a piece of reclaimed land upon Mr. Ware's own farm. The surface of the land did not in some instances afford cause sufficient to account for this defect in the proper operation of the machine. A portion, and perhaps much of it, might be attributed to the yielding nature of the ground, causing an uncertain tread, and perhaps, consequently, more imperfect cut.

Mr. Ware had nearly finished mowing, some ten acres more only remaining to be cut. This was examined on the 14th day of August, in company with another of your committee, and in the opinion of the undersigned, the mowing of this piece was worse than any he had seen. The surface of the land was not so smooth as that of the other fields cut by Mr. Ware. The stubble showed that the grass had been heavy, with a thick and fine undergrowth. Still the land gave evidence, not only of neglect on the part of the driver, but also of bad cutting by the machine, which dragged over the land in places without cutting the grass; and if the quantity of land required to be cut by Mr. Ware is made up, by including this last field, the quality of the mowing done by this gentleman is very materially reduced.

The work of Dr. G. B. Loring, of Salem, was next examined. Dr. Loring had cut some fifty acres, mostly in one field, where the bottom was smooth and level and the burden of grass heavy. The character of the work was above the average, showing an unusually even clip. The machine was tried in presence of the undersigned, upon a piece of reclaimed land, bearing a heavy crop of English grass, and the result was perfectly satisfactory.

Upon visiting Bradford, Mr. W. F. Porter was found in the field engaged in mowing, upon the farm of Mr. Chamberlin. Mr. Porter had cut about one hundred acres of grass, a portion of which, that upon the farm of Col. Newell and others in Newbury, had been examined at the time of visiting Newburyport. Although, as a whole, Mr. Porter had performed his work as well as most of the competitors, still he had erred, as it seemed, from a desire to cut full up to the measured width of his knife, and consequently failing to cut at all in many places. This was particularly visible upon his own farm, and especially at the rounding of his swaths. Mr. Porter was put to the test of mowing a plat of half an acre, measuring four by twenty rods.

The grass, except at one point, was light and thin, the surface smooth, but rolling. The lot was cut in twenty-one and a quarter minutes. His knife-bar was four feet eight inches, and his team weighed 2,490 pounds.

The fields of Mr. Porter were larger and of more even surface than was the case generally.

The next visit was to Mr. H. W. Jones, of Dover, who had mowed about eighty acres. The land mowed by Mr. Jones had been, for the most part, in detached pieces of small size, upon different farms; generally the grass was light, and the surface smooth. The work had been well done.

Upon one piece of land, large sods, pared from the projecting knolls, lay scattered about; yet, notwithstanding the obstruction caused by the great unevenness of surface, the field showed better than could have been anticipated.

Mr. Jones was also put to a trial of his skill in mowing. Half an acre of land four by twenty rods was selected from a larger piece. The surface was level and smooth, and one part covered with a light yield of redtop, and the other portion with a very short and thick coat of fine, limber, natural grass. The mowing was beautifully done in twenty-three and three-fourths minutes. Mr. Jones' horses weighed 1,950 pounds, and his machine cut a swath of four feet and eight inches.

The next examination was of the work done by J. L. Pickering, upon the farm of the Hon. Josiah Quincy, in Quincy. The absence of dividing fences upon this farm had enabled Mr. Pickering to lay his work out in lands presenting a peculiarly attractive appearance. Mr. Pickering had finished his mowing of English grass, having cut over some one hundred acres.

The surface of this farm was level, or very slightly undulating,—beautifully smooth, and encumbered with but one stone which had obstructed the machine.

Except for the one almost universal fault, a want of pointing out, this whole farm would have presented the appearance of one extensive, smooth-shaven lawn.

A promise was obtained from Mr. Pickering, that he would make trial of his machine upon the marsh connected with the farm, and report the result of his experiment.

Upon the 14th of August, in company with two others of your committee, a visit was made to the farm of Mr. G. W. Lyman, of Waltham.

Mr. Lyman had cut about seventy acres of land. The land mowed was level and smooth, and free from obstructions of any kind. The burden of grass had been heavy. Upon a portion

of Mr. Lyman's own farm, being "reclaimed meadow," where the ground was soft, and the bottom uneven, and the growth more luxuriant, some diminution in the quality of the work was apparent—yet, taken as a whole, the mowing was better than that done by most of the competitors.

Mr. Lyman had relieved the committee from both a delicate and difficult task by announcing his withdrawal from the contest; but a gratuity to the operator of the machine, for his skill in its management, is recommended.

Every competitor, who had not withdrawn from the trial, save two in the county of Berkshire, had now been visited, and on the 20th of August, the undersigned reached Great Barrington, agreeably to an arrangement previously made.

To the disappointment of your committee, Mr. John Wilkinson, who had signified his intention of engaging in this competition, had not entered into it, and the person to whom Mr. Wilkinson had furnished a machine for the purpose, had returned it with but one or two days' use.

Mr. Edson Sexton, of Stockbridge, however, had engaged in the trial. The mowing of Mr. Sexton had, for the most part, been done upon his own farm. The land cut over, as a whole, presented a smooth surface, though no part of it had been prepared for the machine.

There were some obstructions to the operation of the machine, arising from rocks and trees. As had been done by every other competitor, save one, Mr. Sexton had trimmed around these with a scythe. It is believed, however, that a long experience will convince Mr. Sexton, and others, that there is no economy in such practice.

Mr. Sexton had done his work well. Some lots, in particular, nearer than his farm to the village, gave evidence of a high degree of skill.

Many opportunities offered themselves of inspecting the operation of different machines, during the time occupied in this examination, and the result was, in most cases, satisfactory. In some few instances a bad cut was visible, but in almost all this was owing to an apparent neglect of the machine. In the opinion of the undersigned, the quality of the mowing of most of the competitors would have been better if the consideration of quantity of acres had been less attended to. There has

seemed to be a somewhat general desire to cut over more land than any other person, rather than to cut better than any other competitor.

The committee will perceive that there has been no expression of opinion as to the merits of any machine. Some were used at the commencement of the trial, which were subsequently abandoned. In some instances it may well be doubted whether a longer continuance in the use of the machine would not have led to a greater degree of satisfaction with its performance. There is no risk in the assertion, that the machine has not yet been put in operation in New England which deserves our unqualified recommendation. Each patent which has come under the observation of the undersigned has serious faults, and it is well that another twelvemonth is allowed to inventors to perfect their machines.

Such as the machines are, however, the undersigned desires to testify to the general good work done by them, and the opinion is unhesitatingly expressed, that much expense and more hard labor has been saved by their use. They can be used, in the opinion of the undersigned, over lands much more rough than has generally been thought safe for them, and used, too, with advantage.

The labor required of the team is not so hard as when used before the plough. It is a curious fact that every competitor is satisfied of the truth of this observation, and the scales in all instances where such test has been applied, showed an increase in weight of the horses while engaged in the mowing trial.

Early in the examination of the lands mowed it was apparent that no judgment of the work of one individual, as compared with that of another, could be formed, based at all upon the closeness of the cut, or, in other words, the length of the stubble left in the track of the machine. A very marked difference, in this respect, was at once perceived, not in all cases depending upon the choice of the operator. Still there is so great difference of opinion about the closeness of cut desirable, and so great a diversity in practice, in different portions of the State, as to forbid the consideration of this point. Some cut high from choice, others made a merit of necessity.

Laying out of view the comparative closeness of cut, the degree of excellence depended almost entirely upon the skill of

the person in charge of the machine, since but one other element, that of evenness of cut, would enter into the question. Close attention was therefore, in all cases, given to the general appearance of the fields, especially to what is called "*pointing out.*"

And about this, so great was the difference that, while the closest scrutiny upon the land cut by one competitor would fail to detect the line of junction between different swaths, upon fields mowed by others the failure in this respect was so great as to leave a long mane of partially clipped or entirely uncut grass, betraying the lines of work as far as the fields could be well seen.

This want of skill was shown on the lands of almost all the competitors. It was not confined to lands of rough surface, broken by rocks, and obstructed by trees, but was most prominent on the smoothest lands of some of the competitors. Arising undoubtedly from the endeavor to "make time," it was seen varying from the comb of an inch higher cut, to a mane of unclipped grass, varying from a line to many inches in width.

Hence there is no doubt that there will be returns of extraordinary large day's work, or, what is more probable, of large surfaces cut over in very short periods.

At the trials of skill to which the competitors were put, it will have been noticed how great was the difference in time occupied by the various individual drivers. This did not arise, as might be suspected, from a difference in the burden of grass standing upon the respective lots, for the heaviest grass was upon the piece of land cut in the shortest time.

Judged by the standard before accepted, the subjoined table will exhibit, at a glance, the different degrees of merit in the work done by the several competitors, being all who, in the knowledge of the undersigned, have not withdrawn from the competition.

Name.	Cut.	Horses.	Gain.	Character of land.	Quantity of work examined.	Quality of work.	Remarks.
William Noble, . .	4 ft 8 in.	1,850,	–	Hilly, with smooth bottom and natural meadows.	35	A 6, B 1.	Generally free from obstructions.
S. Parsons & Sons, .	5 ft. 4 in.	1,985,	–	Connecticut—smooth.	175	A 9, B 9.	Free from obstructions.
Thomas J. Field, . .	5 ft. 4 in.	–	68	do. do.	160	A 8, B 7.	Free from obstructions.
Marcus Barrett, . .	5 ft. 4 in.	–	–	Hilly and rough p't prepared	60	A 10, B 10.	Rocks, and many apple trees.
Walter Bigelow, Jr., .	4 ft. 8 in.	–	–	do. do.	45	A 8, B 9.	Many apple trees.
M. M. Hovey, . . .	4 ft. 8 in.	1,828,	–	do. do.	35	A 8, B 8,	Some apple trees.
George C. Davis, . .	–	–	–	Level, plain, and smooth.	50	A 9, B 8,	Free from obstructions.
Buckley Moore, . .	–	2,573,	–	do. do.	25	A 9, B 8.	do. do.
W. T. G. Morton, .	–	not weighed,	–	do. do.	50	A 8, B 6.	Generally free from obstructions.
G. W. Williams, . .	–	–	–	do. do.	35	A 8, B 5.	Obstructions.
Horace Ware, . . .	–	–	–	do. do.	40	A 8, B 3.	If ten acres last cut are not included by Mr. Ware, B 9.
C. B. Loring, . . .	–	–	–	do. do.	75	A 9, B 9.	do. do.
W. F. Porter, . . .	–	–	–	Rolling—smooth.	100	A 8, B 7.	Free from obstructions.
H. W. Jones, . . .	–	1,950,	–	Hilly, rough, plain, smooth.	80	A 9, B 8,	Somewhat obstructed.
J. L. Pickering, . .	–	–	–	Level, smooth.	100	A 9, B 8,	Beautifully smooth and free.
G. W. Lyman, . .	–	–	–	do.	75	A 9, B 9.	Free from obstructions.
Edson Sexton, . .	–	–	–	Hilly, rough.	45	A 8, B 8.	Rocks and trees.
Levi Stockbridge, .	–	not weighed,	–	Rolling, bottom land.	100	A 9, B 8.	One field much obstructed.

A—denotes smoothness of cut in width of cut. B—denotes evenness of cut or quality of work at junction of swaths. Numerals denote degree of perfection of cut, 10 being highest.

Messrs. William Strong and H. W. Parsons, of Northampton; John A. Morton, of Hadley; Hager Ayres, of Salem; Paul T. Winkley, of Newburyport; E. D. L. Bryant, of Oxford; Robert Brookhouse and Samuel A. Merrill, of Salem; B. Redman, of New Bedford; J. Wilkinson, of Great Barrington; J. D. Wood, of Westminster; and J. P. Adriance, Jr., of Worcester, withdrew from the contest, at different periods of the trial. Some of these, after having cut over some considerable number of acres, others without having hardly started a machine.

For reasons which will suggest themselves, the undersigned makes no comment upon the work done by either of these individuals.

Advantage has been taken by the undersigned of the opportunity he has enjoyed of making examinations of the many fields he has seen in different parts of the State, which have been cut over by mowing machines.

It is not too much to say, perhaps, that in nearly every instance there was greater evidence of bad driving than of bad cutting by the machine. The great enjoyment derived from a hasty examination of the well-ordered farm, and more particularly the beautifully shorn fields of Messrs. Waters and R. S. Rogers, of Danvers, will be sufficient ground to excuse this mention of their names in this report.

The undersigned was led, from a conversation with Mr. J. P. Adriance, to the belief that the necessary engagements of that firm were such as would prevent them from carrying out their intention of competing for the above premium, and it was not till the 25th of August, after, (as was supposed,) the labor of examining the work of every competitor had been concluded, that he was informed that the entry of these gentlemen was filled by Mr. Emerson, of Auburn, who had been running a machine in Worcester and the towns adjoining.

A desire to make immediate examination of the work of this competitor was expressed, and an arrangement was made by which the undersigned was to be informed, without delay, of the names of the individuals upon whose farms this work had been done.

From some probably accidental cause, this information was not received, and examination was made only of the fields

mowed, under this entry, upon the farms of Deacon Chapin and H. Bancroft, of Auburn, Elias Hall, of Millbury, and Lewis Bigelow, of Worcester, amounting, in the whole, to some twenty-five acres. Second crop clover had only been cut upon the farms of Messrs. Chapin and Bigelow. These lands were slightly rolling, the surface generally smooth, and presented no greater obstacles to the fair and uninterrupted operation of the machine than had usually been found. As a whole, there was a want of skill observable in the management of the team. There was an evident want of "pointing out;" otherwise no fault was observable.

The lands of Messrs. Bancroft and Hall were more hilly and uneven, and the latter, especially, much obstructed by fixed rocks.

The land showed plainly that the operator had raised his knife-bar over the rocks which were met in his swath, suffering it to fall to the ground after the obstruction had been passed. Of course, there were patches of greater or less extent, of uncut or partially cut grass, scattered over the fields, betraying the number always, but not always the extent of the obstructions.

The committee will at once see that where the knife-bar is raised over a rock of small superficial extent, a portion of grass, extending the whole width of the knife, from the point at which it is raised to that at which it again touches the ground, is uncut. Hence the field does not present so smooth and agreeable an appearance to the eye as would otherwise be the case.

The question of the economy of such mowing, of course, arises, in this particular case, when the condition of the machine is taken into account, not difficult of solution.

It was unfortunate for this competitor that he entered at so late a period into the trial; as the fields most favorable to the operation of a machine had already been cut over.

In the opinion of the subscriber, the work of Mr. Emerson gives evidence of more zeal than good judgment. No one could advise another to put into use machinery of any kind, upon land so rough as was most of the land mowed by Mr. Emerson on Mr. Hall's farm; and the competitor deserves praise

only for the skill and perseverance he has shown in the completion of a work to all seeming rashly undertaken.

Upon the examination of the machine used in this work, still, on the 4th of September, remaining upon Mr. Hall's farm, it was found seriously damaged, to an extent greater, probably, in a pecuniary view, than had been sustained by all other machines which had been operated in competition for this premium.

All which is respectfully submitted.

WILL. S. LINCOLN,

Examining Committee.

September 5, 1855.

ESSEX.

From the Report of the Committee.

The committee, (consisting of J. W. Proctor, J. H. Duncan, M. Newell, J. How, E. S. Williams, R. P. Waters, and William Sutton,) fully impressed with the importance of the subject intrusted to their care, and the deep interest awakened in it throughout the county, the Commonwealth, and the entire community, have given it all the attention in their power to bestow. When advised, by a communication from the trustees of the Massachusetts Society for the Promotion of Agriculture, that their attention had been called to the same subject, (probably by the generous donor who had placed funds in their own hands in trust for this purpose,) they became anxious to do what they might to co-operate with said trustees. Accordingly they gave notice that, early in July, as soon as the grass should be in condition to be cut, they would personally attend to the operation of all *mowing machines* to which their attention might be called. Eight entries were made with the secretary, five from the southerly and three from the northerly sections of the county.

On the 16th of July a trial was had on the grounds of Dr. Loring, one of the competitors, at the Pickman farm, in South Salem. The machines of Messrs. Loring and Ware, together with those of several other gentlemen, were there upon the field,—each cutting, by the aid of horse power, in from ten to twenty minutes, one-quarter of an acre of grass, yielding about one and a half tons to the acre. This was done in the presence

of many citizens and farmers, some of whom had never before seen the operation of such machines, and to the great gratification and instruction of all.

On the 17th, a like experiment was had on the farm of Col. Newell, of West Newbury, one of the committee, who not only opened his fields, but his house also, to all who chose to go in. The committee were much pleased with these experiments, and encouraged the competitors who had taken part in the performance to go on. The committee also took occasion, as they had opportunity, to look into the fields of the several competitors, and to inform themselves of what they did, and how they did it, so that they can say, with great confidence, that each and every acre reported in the statements of the competitors to have been cut the present season, has been examined, either at the time of the cutting or soon afterwards, by one or more members of the committee.

The committee, themselves novices in these experiments, do not presume to be competent to judge of such machines, or of the work done by them. All they claim is, to have observed with care, and to have done what they might to qualify themselves to judge, and to have heretofore been experienced in the cutting of grass in the ordinary way, by the use of the common scythe.

From the returns of work done the following facts are abstracted:—

Implements used.	By whom used.	Acres cut.	Average time of cutting to the acre.	Average quantity to the acre.
No. 1, Manny's machine, made by Adriance & Co., of Worcester.	W. F. Porter, of Bradford; horses weighing 2,500 lbs.	116	54 minutes.	1¼ ton.
No. 2, Ketchum's machine, made by Ruggles & Co. of Boston.	George B. Loring, of Salem; horses weighing 2,000 lbs.	51½	52 minutes.	1½ ton.
No. 3, Manny & Co.'s machine, made by Adriance & Co., of Worcester.	Horace Ware, of Marblehead; horses weighing 2,100 lbs.	54	48⅙ minutes.	1¾ ton.

For further particulars of the operation of these machines, and of the repairs of the injuries incident thereto—the average

amount of which is less than five cents an acre to grass cut—see the statements annexed, which are to be published in full, as speaking more instructively than any description in the power of the committee to give. They tell the story of the operation in a reliable and natural way.

The special premiums accruing from the funds given by R. S. Fay, Esq., of Lynn, one of the Vice Presidents of the Society, were, by his consent, stated as follows, viz:—

1. For the best and most satisfactory experiment with a mowing machine, operated by two-horse power, on not less than fifty acres, on any farm or farms within the county, $50.

2. For the best and most satisfactory experiment with a mowing machine, operated by one-horse power, on not less than twenty-five acres, on any farm or farms within the county, $25.

These were the only premiums offered for work to be done.

There was no competition for the second premium—one implement of the kind having been brought to the notice of the committee, and this operating for a short time only.

At a special meeting of the committee, on the 13th of October, all present, except Messrs. Duncan and Sutton, it was determined, with a united voice, that the experiments presented demanded the award of the first premium offered. Whereupon, after a careful examination of the statements, and a free discussion of all the points presented, it was determined by a vote of a major part of those present, (the chairman, in conformity with the vote of the trustees, expressing no opinion,) that the premium of $50 be awarded to William F. Porter, of Bradford.

In making this award for the work done only, the committee wish it to be distinctly understood that they do not intend in any manner to give a preference for one machine over the other,—because they do not feel themselves sufficiently informed as to the principles involved in the structure and operation of the machines to express such a preference. They indulge the hope that it will, ere long, be in the power of the makers to make them more complete, both as to the quality of the materials and the manner in which they are put together. Notwithstanding the satisfaction they have experienced in witnessing the work done, they are constrained to say, that the accidental injuries have been so many, and so oft-occurring, that

they cannot recommend these machines without this qualification.

The committee cannot but regret that they had so little opportunity to examine machines operated by one-horse power. From what they did see, and what they have otherwise learned, they believe that machines of this character may be advantageously used on New England farms. The committee cannot express themselves too highly in favor of the use of oxen—well-trained oxen—on mowing machines. They saw them thus operated on the farms of Messrs. Sutton, Loring, Newell, and Waters, gentlemen in the possession of as fine farms as any in the county, and who have as much discrimination in the use of such implements as any among us.

It is to be borne in mind that the experiments made with mowing machines were made on grounds not specially prepared for their use, and under the direction and guidance of those not accustomed to their use; therefore great allowance must be made in comparing the results with what may be hoped to be done under circumstances more favorable. In view of all these considerations, the committee cannot for a moment doubt, when machines are made as complete as they may be, with a reasonable degree of care in the makers, and a disinterestedness that shall not demand too large a profit, that they will come into general use, in all grass-growing districts. The committee are satisfied that it has been unequivocally demonstrated, that one man, with a good pair of horses or oxen, suitably trained to the work, can cut one acre of grass an hour, yielding from one to two tons to the acre,—or from eight to twelve acres per day, under favorable circumstances, at a cost of labor not exceeding fifty cents per acre.

Suppose the lot to be cut to measure sixteen rods by ten rods—containing just one acre—and suppose the machine to cut swaths varying from three to six feet, then the number of swaths required in the cutting of an acre will be as follows, according to the width:—

55	swaths,	each	.	.	.	3	feet	in width.
47	"	"	.	.	.	3.5	"	"
41	"	"	.	.	.	4	"	"
37	"	"	.	.	.	4.5	"	"

35	swaths,	each	.	.	.	5	feet	in	width.
30	"	"	.	.	.	5.5	"	"	
28	"	"	.	.	.	6	"	"	

Fifty minutes' time being allowed for the cutting of an acre (which is the average time derived from the statements herein noticed,) it is apparent that each swath can be cut in less than one minute. Allow for turning at the end, one-quarter part the time taken in cutting, and it will be matter of demonstration, that, with the ordinary speed of a team at work—say between two and three miles to the hour—an acre of grass can be cut within the time mentioned.

For the reasons herein before stated, the committee thought it inexpedient to presume to make any award of the premium of $25 for the best mowing machine presented at the show. This could not be done without giving a preference, in some respects, to one machine over another. And as the committee are unanimous in the opinion that all the machines are less complete than they should b , they forbea to specify their deficiencies, leaving them to be discovered by mec anics more expert than themselves. While got up, as were Pindar's razors, to sell, the machines will never be worth buying.

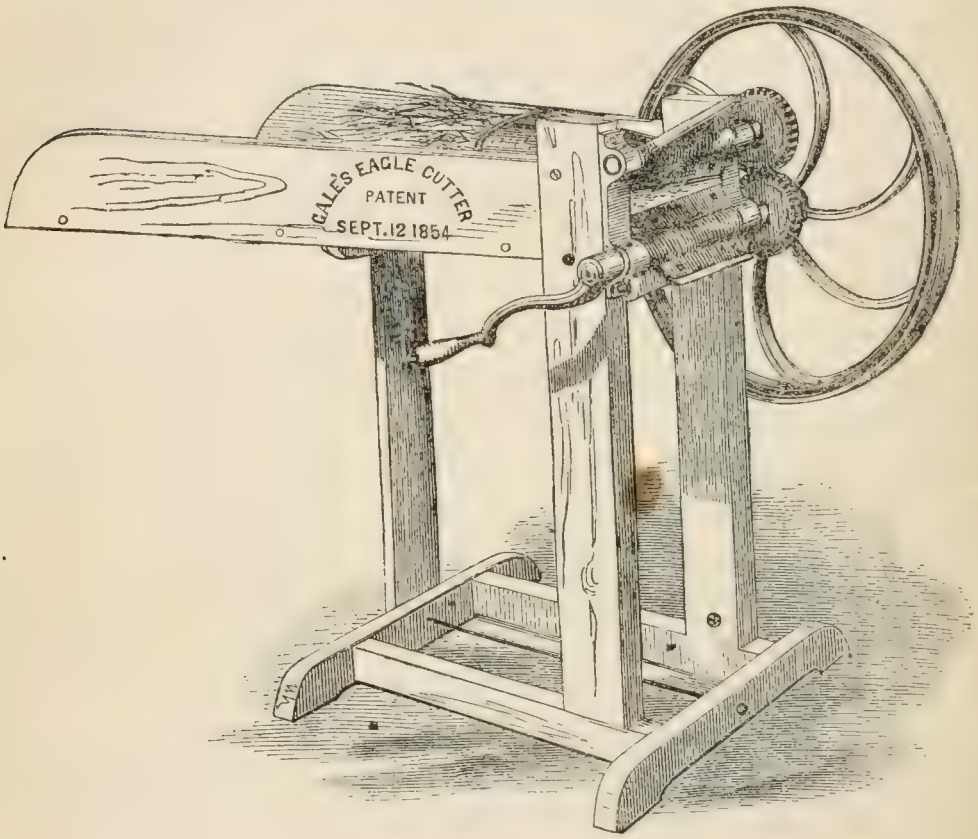
The committee, when they commenced their labors, hoped to have given a favorable report of a new form of mowing machine, made by a Massachusetts mechanic, Fisk Russell, of Boston, of which some notice was taken the last year. But they will wait one year more, when they hope a combination of circumstances will enable a more favorable report to be given than can now with propriety be made. They are satisfied it is not without merit. They are by no means sure that its cutting principle is not superior to any other.

The bounty of the generous donor was not confined to one class of implements, but extended to all useful implements presented. The committee regretted that a greater variety had not been brought to their notice.

The fourth premium offered, " for the best and most useful agricultural implement not being a mowing machine, $20," they cheerfully and unanimously award to E. D. L. Bryant, of West Boxford, for his thresher and cleaner of grain, an implement to which their attention was called at the exhibition in

1854, and which they are well assured has done much good service in Boxford, Andover and Bradford, the present season.

To Messrs. Nourse & Co., of the Eagle Agricultural Warehouse, Boston, they award $10, for a hay-cutter, prepared to guard against cutting off boys' fingers.



The committee had intended to make some further remarks on the materials proper to be used in the structure of farm implements, and the manner of finishing the same, but are admonished by the space already taken, that it may not be expedient for them to say more. They recommend that the statements of Messrs. Porter, Loring and Ware, all of which are drawn with care, truthfulness and ability, be published in connection with this report.

J. W. Proctor, *Chairman.*

GEORGE B. LORING'S STATEMENT.

Record of Work of Mowing Machines, manufactured by Ruggles, Nourse, Mason & Co., and by Henry, Rice & Co., in the year 1855, patented by Ketchum, and by Russell, in the year 1855, the cost price of which was $——; owned or worked by George B. Loring, of Salem, who has entered the same for the premium offered by the Essex Agricultural Society:—

Date.	Acres cut.	Hours per Day.	Animals employed.	Weight of Animals.	Animals changed.	Accidents.	How repaired.	Miscellaneous Remarks.
1855.		H. M.						
July 5,	1½	2	Horses.	2,000	–	Broke one knife, . .	Replaced by driver, .	Used Russell's mach'e; cut poorly.
" 6,	¾	.45	"	2,000	–	Broke wheel, . . .	Replaced by machinist,	do. do. do.
" 8,	2¼	1.45	"	1,900	one horse.	Broke the rod, . . .	Obtained another in Boston,	do. do. do.
" 10,	1½	1.15	"	1,900	–	Wheel slipped, . .	Keyed by the driver, .	do. do. do.
" 12,	½	.30	"	1,900	–	Knives failed to cut, .	Irreparable, ...	Abandoned the machine.
" 16,	4	3.50	"	1,900	–	– –	– –	Commenced using Ketchum.
" 17,	3	2.50	"	1,900	–	Broke one finger, . .	Replaced in the field,	Ground rough, grass dry, cut easily.
" 18,	4	4	"	1,900	–	– – [rod.	– –	Grass heavy, bottom thick, cut well.
" 19,	2	1.45	"	1,900	–	Broke pin to connect'g	Repaired by blacksmith	Cut well and easily for horses.
" 23,	4	3.50	"	1,900	–	Broke one finger, . .	Replaced by driver, .	Ground stony, grass fine and light.
" 26,	5	4.55	"	1,900	–	Broke two fing's, warped bar,	Replaced finger, . .	Grass heavy and ripe, ground rough & stony.
Aug. 2,	2	2	"	1,900	–	– –	– –	Rough reclm'd meadow, horses worked easily
" 3,	4	3.50	"	1,900	–	Broke finger and pin,	Replaced finger; got	Grass, 2 tons to acre; ground rough; cut well.
" 4,	3½	3 30	"	1,900	–	– –	[pin at blacksmith.	Horses worked with great ease.
" 7,	4	3.45	"	1,900	–	Broke finger and pin,	{Replaced finger, got supply steel pins.} .	
" 8,	6	6	"	1,900	–	Broke finger and knife,	Repaired by driver, .	
" 9,	6	5.30	"	1,900	–	Broke two fingers, . .	Not repaired, . . .	Used duplicate knife-bar. [cally.
" 24,	4	3.30	Oxen.	2,800	–	– –	– –	Salt grass; cut easily and economi-

Total number of acres cut, 58; in 50 hours and 10 minutes. Russell's machine cut 6½ acres in 6 hours and 15 minutes; Ketchum's, 51½ acres in 43 hours and 55 minutes.

I make the above returns of mowing done upon the Pickman farm, in Salem, during the present season. I have used two machines as the record will show. Russell's machine, with which I began, occupied much of my time in the early part of the season, and after a faithful trial of it, in which I endeavored to give the inventor every opportunity to arrange it for use, I was obliged to abandon it. I then commenced with Ketchum's machine, the fifty-one and one-half acres of whose working are contained in the above record, and which I enter for premium.

The land upon which I used the machine is by no means well adapted to the purpose. It is in many places uneven with hill and valley, and in almost all places rough and stony. The substratum is clay, and the soil is so heavy and springy that it is very difficult to preserve a smooth surface from the action of frosts and thaw, and from the passage of cattle and wheels upon it. On this account there is hardly a field on the farm possessed of a smooth and even surface. A portion of the grass was cut upon reclaimed meadow, which had not been ploughed since it was laid down for the first time, about five years ago, and which presented a very bad surface of furrows, ditches, holes and hammocks. The grass in some parts of the meadow was heavy, from two to two and a half tons to the acre, with a very thick, close bottom.

In such mowing as this, I have found no great difficulty in using the Ketchum machine. It was seldom clogged, the draught has never been greater than my horses could endure, at an easy pace all day, and it has adapted itself to the uneven surface with perfect success. I have had it driven steadily, and at a rate of speed always within the power of the horses to continue hour after hour.

The chief difficulty I have met with has been the insufficient strength of the knife-bar. It will be noticed in my record that I have had frequent accidents—to be accounted for mostly by the roughness of the land. But I have found that in heavy grass, which was very firm and ripe, with a thick bottom, and on a rough surface, the fingers are quite liable to be warped and bent, even when they do not encounter stones or other such obstacles. In such grass, and on such a surface, the knife-bar itself was found to have been somewhat bent. The knives worked well, and in spite of defects in the bar and fin-

gers, they succeeded always in cutting the grass. I grant that the land upon which I used the machine was a severe trial to it; but I conceive that it is to be made perfect through just such trials.

The breaking of the pin which holds the connecting rod to the knife-bar was a source of considerable annoyance to the driver, and ought to be remedied. After breaking three or four, I succeeded very well with steel pins.

In my record I have not included the time occupied in repairs, as the accidents have not interfered with the amount of labor we wished to accomplish with the machine.

Even in a season whose irregularity of weather has prevented my using the machine as much as I could have wished, I have found a means of saving a great amount of labor. Seven men have been employed on the farm, where we have usually had twelve or more, in the haying season; and during a portion of the wet weather they have been employed with the scythe, for the want of other work.

I would call your attention to the working of the machine in salt grass, with oxen. It worked admirably. It moved easily over the marsh, the oxen were borne with perfect safety, their speed was sufficient, and the amount of grass secured was much greater than that cut by the scythe on the same extent of surface. I think a machine might be constructed with a wheel adapted to our softest marshes, to be drawn by one horse or by oxen, which would save an immense amount of labor, where so much labor is expended upon so small a crop as our marshes usually yield.

Salem, September 10, 1855.

WILLIAM F. PORTER'S STATEMENT.

Record of Work of a Mowing Machine, manufactured by John P. Adriance & Co., in the year 1855, *patented by J. H. Manny, in the years* 1851, 1852, 1853, *and* 1854, *the cost price of which was* $115; *owned or worked by William F. Porter, of Bradford, who has entered the same for the premium offered by the Trustees of the Essex Agricultural Society.*

Date.	Acres cut	Hours per day.	Animals employed.	Weight of animals.	Animals changed.	Accidents.	How repaired.	Miscellaneous Remarks.
1855.		H. M.						
July 3,	4½	3.50	2 horses.	2,490	None.	None, ...	– –	For myself, Bradford.
" 6,	5¼	4.45	"	2,490	"	None, ...	– –	do. do.
" 9,	3	3.20	"	2,490	"	None, ...	– –	O. Locke, Bradford.
" 9,	1¼	1.05	"	2,490	"	Broke one blade, . .	Riveted on, . . .	C. Webster, Bradford.
" 10,	5½	4.30	"	2,490	"	None, ...	– –	J. Newell, West Newbury.
" 12,	8	7.04	"	2,490	"	None, ...	– –	J. Kimball, West Newbury.
" 13,	4½	4.42	"	2,490	"	None, ...	– –	M. Newell, West Newbury.
" 13,	1¾	1.16	"	2,490	"	None, ...	– –	J. Emery, West Newbury.
" 14,	5	4.36	"	2,490	"	Broke one finger, . .	Screwed on, . . .	J. Newell, West Newbury.
" 14,	2¼	2.04	"	2,490	"	None, ...	– –	J. Emery, West Newbury.
" 16,	3	2.32	"	2,490	"	None, ...	– –	Myself, Bradford.
" 17,	2½	1.54	"	2,490	"	Broke one blade, . .	Riveted on, . . .	M. Newell, West Newbury.
" 18,	8	7.28	"	2,490	"	Broke one brace, . .	Bolted on iron, . .	do. do.

July 19,	8	7.20	2 horses.	2,490	None.	None, ...	–	–	J. Newell, West Newbury.
" 23,	1	1.12	"	2,490	"	None, ...	–	–	M. Newell, West Newbury.
" 25,	9	7	"	2,490	"	Broke one blade, . .	Riveted on, . . .		do. do.
" 26,	5	5.16	"	2,490	"	Broke one blade, . .	–	–	do. do.
" 28,	2	1.32	"	2,490	"	Broke one blade, . .	–	–	For myself, Bradford.
Aug. 1,	6	5.12	"	2,490	"	Broke one finger, . .	Screwed on, . . .		R. Slocomb, Haverhill.
" 2,	1	.54	"	2,490	"	None, ...	–	–	do. do.
" 2,	2	1.28	"	2,490	"	None, ...	–	–	L. Maynard, Bradford.
" 3,	1½	1.12	"	2,490	"	None, ...	–	–	do. do.
" 3,	2½	1.55	"	2,490	"	Broke one finger, . .	Screwed on, . . .		N. Peabody, Bradford.
" 3,	1½	1.13	"	2,490	"	None, ...	–	–	L. Maynard, Bradford,
" 6,	7	6.06	"	2,490	"	None, ...	–	–	William Brown, Haverhill.
" 7,	3	2.40	"	2,490	"	None, ...	–	–	do do.
" 7,	1½	1.06	"	2,490	"	None, ...	–	–	L. Maynard, Bradford.
" 8,	1	.52	"	2,490	"	Broke one finger, . .	Screwed on, . . .		do do.
" 30,	4¾	3.52	"	2,490	"	None, ...	–	–	For self, Bradford.
Sep. 20,	4¾	4.20	"	2,490	"	None, ...	–	–	Joseph How, Methuen.

Total number of acres cut, 116.

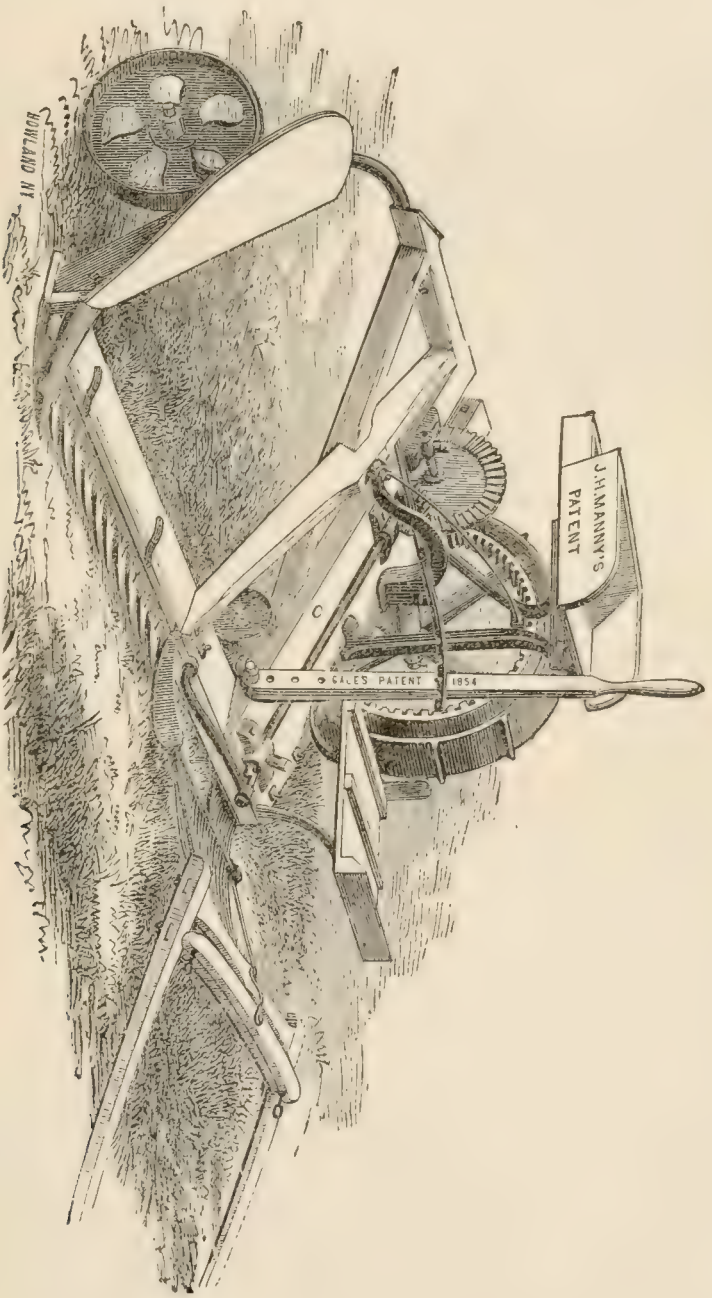
The lots of grass enumerated in the above schedule, varied from one-half ton to three tons per acre,—average one and a quarter tons or more.

The horses weighed, August 23d, 2,594 lbs. They had at no time, while mowing the above, more than six quarts of grain per day, which was Indian meal. They performed more other labor on the farm, such as ploughing, carting manure, rocks, &c., than that of mowing the above. All breakages and accidents were caused by rocks that could not be seen; and it is surprising there were no more, as on several fields I ran the machine against from ten to twenty heaps of small stones or fast rocks, in size sufficient to stop the horses, without breaking or injuring the machine, except sometimes gaping or dulling the cutters.

Early in the season I concluded to compete for the State and county premiums offered for mowing by horse power, and obtained three different mowing machines, viz: Manny's, Ketchum's and Russell's. After mowing, at several different times, about six acres with each machine, I concluded to use the Manny machine, and return the two others. The Russell machine drew hard, and did not cut the grass as well as either of the others, and appeared to be more likely to get out of repair, as has since proved to be the case. The Ketchum, in my opinion, requires at least one-fourth more power to cut the same grass than the Manny machine. In lodged clover the Ketchum does the best work, owing to the iron finger-bar, which allows the clover, when it is badly snarled and twisted together, to free itself without stopping the horses, as is sometimes necessary with the Manny. But in cutting redtop and herds-grass, yielding from one to three tons per acre, whether it be lodged or standing, the Manny does full as good work, and much the best in all grass yielding less than one ton per acre.

Taking into the account the power required to work the two machines, and the fact that the Manny machine can be transported on its own wheels as easily from field to field, or on the common roads, as a horse wagon—which I have had occasion to do several times the past season, from one to four miles a day, without injuring it in the least—I think it a great improvement over any machine which I have seen, especially if a man has to cut grass on several farms, as I have done the past sea-

son. The workmanship and materials of the Manny machine, at least the one I used, are much the best of any I have seen. The wear is hardly perceptible, except in the scythes, in mowing more than one hundred acres. I see nothing wanting in the Manny machine except the iron finger-bar, which I understand



Manny's Mower.

is to be applied in future, to make it all that is desired, except the price, which is much too high.

The time required to replace a blade or finger when broken, if suitable tools are in a box attached to the machine, as they should

be, is not more than ten minutes. The draft of the machine is so easy, I think a pair of horses, weighing not more than nine or ten hundred pounds each, would perform more work than horses as heavy as my own. More depends on the surface of the land being even and free from stones than on the power required to cut the grass, the difference being but little, whether it yield one or two tons per acre.

During the dull weather, the past haying season, I ploughed and harrowed several days with the same horses, and found the work harder for them to plough common stubble land, or harrow the same hours per day, than to draw the mower.

Whole expense of repairs on the machine during the season was $2.30.

Bradford, September 22, 1855.

HORACE WARE'S STATEMENT.

Record of Work of a Mowing Machine, manufactured by Adriance & Co., of Worcester, in the year 1855, *patented by Manny, in the year* 1851, *the cost price of which was* $115, *owned or worked by Horace Ware, of Marblehead, who has entered the same for the premium offered by the Essex Agricultural Society.*

Date.	Acres cut.	Hours per Day.	Animals employed.	Weight of Animals.	Animals changed.	Accidents.	How repaired.	Miscellaneous Remarks.
1855.								
July 14,	10	7¾	Horses.	2,100	–	Cog wheel broke in consequence of not being properly adjusted.	A new wheel.	Grass, 1 to 3 tons per acre.
" 16,	4½	3	"	2,100	–	– –	– –	Grass, 1 to 3 tons per acre.
" 17,	9	8	"	2,100	–	– –	– –	Grass, 1 to 3½ tons per acre.
" 18,	4½	4	"	2,100	–	– –	– –	Grass, 1 to 2 in small lots.
" 19,	6½	4½	"	2,100	–	– –	– –	Grass, 1½ to 2 per acre.
" 20,	1½	1½	"	2,100	–	– –	– –	Grass, 1 to 2 per acre.
" 25,	3½	3½	"	1,950	–	– –	– –	Grass, 1 to 2½ per acre.
Aug. 7,	8	8	"	2,100	–	– –	– –	Grass, ½ to 1 per acre.
" 30,	5½	3½	"	2,100	*	One finger broke.	– –	Grass, light second crop, which paid for mowing with machine, but would not with a scythe.

Total number of acres cut, 54½.

* Changed on account of weight, the land being soft meadow.

In addition to the above, I have mown about seven acres with one of Russell's machines, which, in consequence of its liability to get out of repair, I had to throw aside, it having broken six or seven times in the operation. It appeared to have too quick a motion—iron and steel not being able to stand the racket.

The action of the knives I think very well of, but the operation of the two wheels is unfavorable, as they are placed, unless the ground is perfectly level; for the elevation or depression of either wheel throws the knife-bar out of level, in consequence of which the grass is cut too high or the knives are in the ground.

The Manny machine that I offer to your notice I cannot speak too highly of.

I am satisfied that an acre of grass can be cut in half an hour, or that fifteen acres can be cut per day, without injury to the team; for its ease of draft enables the horses to perform a quarter more work in the same time (in my opinion) than any other machine that I have seen.

The reason of its greater ease of draft is, that the wheel at the end of the knife-bar is so placed that the draft removes the friction; that is, as the horses move, there is a constant lift on the knife-bar, which removes the friction from off the ground; in other words, the machine goes on wheels instead of dragging on the ground.

Another great advantage in this machine is the ease of moving it from field to field, or from one farm to another; it being thrown out of gear, and the knife-bar raised by means of the brake, fifteen or eighteen inches from the ground in less than a minute, and put in working order in the same time.

It also adapts itself to uneven surfaces with the greatest facility, having cut the grass in the most perfect manner, where Russell's machine would not work at all.

From my experience the past season, I am satisfied that there is an actual gain in quantity in the use of the machine to the amount of $1 per acre; or, in other words, it is better to pay $1 per acre for mowing with the machine, than to have it done by ordinary mowers (such as we can get) for nothing.

With regard to its liability to breakage, I do not consider it much greater than that of the scythe and snath; the only

accidents that I have met with in the use of the machine were caused by its not being properly put together, or by loose stones left on the ground.

MARBLEHEAD, September 22, 1855.

HAMPSHIRE.

Report of the Committee.

Science and art have been constantly producing wonderful changes in all departments of industry. The agriculturist, once slow to comprehend the importance or necessity of any change in form or substance of the farming tools used by his father, now realizes that changes may be made which are decidedly beneficial. We need but to go back thirty or forty years, to draw a striking comparison with the times in which we live, and articles in daily use. Many farming tools of former times are becoming obsolete, and are seen only occasionally in a corner of some old garret, having been superseded by "labor-saving machines."

Of the implements used for agricultural purposes, nearly all have passed through such a transformation, in the march of improvement, that some of them could hardly claim the relationship of "third cousin" to their predecessors of the same name. Others again, "new and rare" things, which our fathers dreamed not of, are now considered almost indispensable to every farmer.

Among the many good results growing out of the formation of agricultural societies, is the rapid improvement in farming tools. In no department of industry are improvements progressing so rapidly as in agriculture. The fact is noted in the Patent Office Reports, "that the greatest number of patents applied for and issued, of any one class, are connected with agriculture, and the fewest are those to be used in war,"—it is said the proportion is nearly as ten to one. This probably in part arises from the fact that improvements can be made; that agricultural societies stimulate such improvements; and partly, because labor-saving tools are necessary, owing to the scarcity of farm laborers and the high price of labor. It is hoped another good may be the result of these exhibitions of skill and indus-

try. Our young men who, in years past, have been disposed to forsake the old homestead, and the tilling of the ground for positions and occupations in cities and large towns, with a *future prospect* of a little more cash, but far less independence, may be enabled to see that there is a scope for the mind, in the science, as well as art, of farming; and by the use of the improved and labor-saving machines, the farm work is not all mere drudgery. At the same time there is more real enjoyment of the gifts of a bountiful Providence than can be obtained in the usual employments of the dense population of a city. The farmer and mechanic are so closely connected in interest and so dependent upon each other, that it is desirable they should, on an occasion like this, meet on common ground, and together enjoy that interchange that is necessary for mutual improvement. We hope the fairs of this society will increase in interest in this essential department of agriculture.

FRANCIS DEWITT, *Chairman.*

From the Report of the Committee on Mowing Machines.

We have ever felt a deep interest in the success of mowing machines. We have too many reminiscences of aching bones, of garments steeped in sweat, and of exhausted lungs, not to desire most fervently the introduction of some instrument that shall cut grass evenly, without clogging, and with ease to the team that does the work.

Of the relative merits of the different machines it is not our intention here to speak. The most prominent ones in use in this State are Ketchum's, Manny's and Russell's. These have been tried side by side, in various parts of the State. Committees have been appointed to see them work, and their decisions are before the public. Doubtless each has its merits and its defects. The former we shall be most grateful for; the latter, point out to the manufacturer, that he may remedy, if possible. We should be satisfied with nothing short of a perfect machine, until we are sure such an one cannot be made. Let us then enumerate some points which we think essential to such an instrument:—

1. It should be easily drawn.
2. Easily conveyed from field to field.
3. Easily managed while at work.
4. It should cut close.
5. It should cut smooth or without clogging.
6. It should lay the grass evenly.
7. It should be able to start in grass without backing.
8. It should cut equally well with or against the wind.
9. It should be adjusted so as to cut high or low.
10. It should not be liable to get out of repair.

Perhaps some may say that these ten requisites cannot all be combined in one machine. It may be so; and yet it is encouraging to know, that they are found, to a good degree, though not in perfection, distributed among the different machines above mentioned. For instance, we have one or two machines which are tolerably light of draught, viz.: Manny's, and Ketchum's improved. The former of these is generally so acknowledged; but whether, in reality, it has any claim to superiority in this respect, can only be determined by an instrument made for the purpose. At a trial held on the farm of T. P. Huntington, of Hadley, in June last, we suggested that the competing machines should be subjected to some such test; but it was not done. It is a matter of some importance, and we may have occasion to refer to it again. In regard to the second and third of our requisitions, Manny's seems to be nearly perfect; while in regard to the fourth and fifth, both that and Ketchum's do very fair work, though on the fifth point they are not faultless. We are aware that it is claimed for both these machines, that they will not clog, and we gladly concede that, in ordinary mowing, they do not; but we have witnessed instances, the past season, in which both proved themselves imperfect on this point. The difficulty arises, probably, in part at least, from the fact that the knives work about half of the time at a disadvantage. The course of the knives on the ground being serpentine, or zigzag, it is easy to see that the central part of each stroke is made at much the best advantage. When this difficulty shall have been fairly overcome, the great problem of mowing with machines will be solved. Mr. Russell's mower, though operating unfavorably in some respects, is, as far as our knowledge extends,

without fault in this. Our acquaintance with it, however, is limited, and we would not positively claim for it so desirable a quality. On the sixth point, Ketchum's is all that can be wished. The eighth point is accomplished with Manny's mower, by the use of the reel, and we know of no other way in which it can be done. We presume it would be next to impossible for any man to spread grass as evenly as this machine. On the other hand, Manny's, by being made to cut at any desired height, possesses peculiar advantages in mowing over stubble grounds, that are growing up to weeds, mossy and stony lands, &c.

Thus it will be seen, that each machine has its own merits and defects. Our object in speaking of them is not to make invidious distinctions, but to stimulate to further improvement. It is by no means desirable that all should be made by the same pattern. Competition, besides being the life of business, may almost be said to hold in her hands the guarantee of perfection. Nothing has contributed more, as we believe, to the excellence of our ploughs, than the rival manufactories at Boston and Worcester; and so close has the competition become, that he must be a niggard in his commendations who hesitates to award the merit of success to the conductors of either of those establishments.

So let it be with mowers. Let each improve his own, and each will receive his due share of patronage. But we venture to say, our farmers will never accept of a machine that will not cut all kinds of grass, and cut it close. If there is any thing that the better class of them take a pride in, it is a well-mown field; and a machine that does not work among the lower joints of the grass will hardly find favor with them. Neither do they want one that requires an extra horse and hand to run to the blacksmith's for repairs. Especially would we urge the importance of lessening, as much as possible, the draught. Though great improvement has been made in this particular, there seems no reason for supposing we have attained its limit. A pair of horses now does the work of only five or six men, which shows a great loss of power somewhere. If by any means this could be saved, it would be an achievement worthy of the best efforts of our mechanics, and would, probably, add more to the well

being of the State than the thousand and one schemes offered by sagacious politicians for the same purpose.

Hitherto, the success of a machine has depended too much upon the man who has managed it. We want such machines as common farm laborers can operate. We are neither able nor willing to hire mechanics to cut our grass. If done at all, it must be by the ordinary help of the farm, and whenever manufacturers shall furnish us with good, practicable machines, proved to be such, at reasonable prices, they may be sure of an extensive demand for them.

THEO. G. HUNTINGTON, *Chairman.*

NORFOLK.

Report of the Committee.

The committee on Agricultural Implements have to report nothing new as on exhibition at the cattle show, in this department, although there was quite a number of specimens of those long familiar implements—the most essential in the work of agriculture—which serve to illustrate the improvement and progress made in this branch of the science.

The committee, in former reports, have remarked on the peculiarities of our condition in New England, in regard to agricultural implements, as contrasted with the Middle and Western States. Our uneven and rocky soil, as a general characteristic, forbids the use of many of those labor-saving machines which inventive genius is ever ready to create to the demand of necessity and profit; and hence the narrower limit to which our show of implements is confined—so different from the extensive variety and the constant multiplication of new designs, adapted to the execution of almost every description of agricultural labor, as is seen, for example, at the exhibitions in the State of New York.

This statement is not made in the spirit of complaint at the scantiness of the articles exhibited at our exhibitions; although we believe that a public spirit, which should afford an extensive display of those splendid specimens of mechanical skill and ingenuity, which, in our day—so widely different from former times—are displayed in agricultural implements, would be am-

ply rewarded, even if new models and machines were rare, and the spectator was called to view only those with the uses and importance of which he was already familiar.

The character of our people for inventive genius and skill is too well established in the records of the country to allow the suspicion that the mechanics of New York and Pennsylvania surpass them in ingenuity and skill, because they do in the number of their inventions in the department of agricultural implements recorded at the Patent Office at Washington. Human ingenuity is at the command of want and necessity, which are always allied with the overpowering stimulus of profit; and it is the character of the soil that is to be cultivated in the Middle and Western States, that inspires the genius of the mechanics in those States. Our variety of implements, although meagre compared with some other sections, is probably fully equal to the demand of the times, and has kept pace with the spirit of intelligence and general improvement which prevails so universally at the present time. The difference in ploughs, rakes, shovels, hoes, axes, forks, carts, and all other ancient implements, as they appear at the present day in contrast with the past, attest sufficiently the attention and skill bestowed on this branch of science; and the only enigma left to excite the wonder of the economist is, that they seem to have had no other effect than to enhance the price of the crops they help to bring forth and were intended to multiply.

There seems to be a principle at work which requires that, in proportion as the fruits of the earth are aided in their production by beautiful and superior implements, the more costly they shall become. When the wooden ploughshare, with scarcely metal enough to grow bright by the friction of the earth, as the slow-moving oxen dragged it along—stimulated more by the whip of the driver than the vigor of their bodies—was the only instrument to break the glebe, the potato, that staple commodity of the million, was supplied for one-eighth of a dollar per bushel, while the superb instrument, which has now become an object of attraction, and almost veneration, in the crystal palaces of the world, with the Koohinoor and Minnie rifle, cannot do the same work without the exaction of a whole dollar, or eight times as much.

It would not seem to be the policy of the agriculturist to

complain at the extravagant prices of his productions; but what is the peculiar blessing of improvements so greatly extolled, if the result of their introduction is chiefly seen in the enhancement of the price of the necessaries of life, to such an extreme as to drive the people from the homes of their childhood to a country where the boasted civilizations of our section have but just commenced to dawn?

With all our commerce, and such manufactures as produce, as if by enchantment, the cities of Lowell, Manchester, Lawrence, &c., were it not for the mechanical industry of our shoemakers, who, with their lapstones and waxed ends, extort, by the employment of all their time and energies, their sustenance from the West, would not our towns become depopulated, and our hill-sides and valleys suffer the atrophy of neglect?

If some one, who relies more on the vain boastings of the press, and the assumptions of the present generation, than on facts and figures, feels inclined to question the suggestions we have made, let him give the world the solution of the enigma we have presented, in a manner that will convey the truth to the people, and we then shall have gained something more by this report than we expected when we took up the pen.

There was, however, one peculiarity which distinguished the implement show of this year, and that was, that most of the articles were manufactured in the county.

There were seven ploughs—which is, after all, the chief, as it is the most ancient of agricultural implements—which, with their polished coulters, and their graceful curves, suggested the idea of a greyhound that is anxious to leap to the conquest of his prey; one "improved" cultivator, which indicates that, up to the present year, genius had not entirly exhausted itself on that instrument; one "horse hoe," whose form and shape we have not retained in our memory, strange as it may seem that we should forget the implement which was apparently designed for the use of man, had been given into the possession of that noble animal, the horse, who is destined, perhaps, soon to surpass his human rival in the use of an instrument which the latter has monopolized from the days of Nineveh; one "ox yoke," to which but a single objection could be made, which was, that it seemed made to break or to bow the necks of the faithful animals who were destined to wear it. There was a number

of smaller implements, in the class of shovels, hoes, forks, &c., which were creditable to the manufacturers, and are famous throughout the country—the shovels of Ames, and the forks of Patridge.

In passing through the enclosure devoted to agricultural implements, at the show of the State society, held at Elmira, New York, the writer of this report was obliged to inquire, not only the names, but the uses of a considerable number of formidable looking implements that constituted the vast display. They plant, they sow, they dig, they pull up weeds, they reap, they mow, they cut, and they cover, and they do almost every thing that is required in the great business of cultivation. They formed a most pleasing part of the exhibition, and seemed to encourage the idea that the time was fast approaching when the combined elements of wood, water and iron might be sent into the field, perform all the labors which the Deity imposed, according to the Scriptures, on the human husbandman, while the latter might be reposing in the shade of trees, planted by machinery, indulging in siestas, made more profound by the aroma of the pipe, and dreaming of that millenium of ease and luxury, when the farmer shall eat his bread, as well as the merchant and the lazy lord, without any accompaniment of "the sweat of the brow."

An exhibition of mowing machines was held at Dedham, during the summer, under the ausipices of the society and of a committee appointed at the request of "the State Society for the Promotion of Agriculture," on its offer of a premium of six hundred dollars for the best experiment of a mowing machine, on fifty acres, within the State. It was found impracticable to carry out the design completely, in consequence of the great labor and expense of superintending the numerous trials, in various places, that would be requisite to a proper understanding of the merits of the various machines entered for premium.

The single trial, however, was well conducted, and afforded an interesting and useful spectacle to a large company of visitors, many of whom had never before witnessed the operation of that invention, which is to cause a revolution in the mode of hay gathering in all parts of the country, and especially in those States where the fields are extensive, and unobstructed

by stones and stumps, and other impediments that would interfere with the wide and rapid sweep of the instrument.

A report of the trial, by one of the committee, was published at the time, in one of the county newspapers, the *Dedham Gazette*, which, being supposed to convey, in brief, the general impressions of the committee, is inserted, as follows, as a part of this report:—

The Mowing Exhibition.—The first public trial, or contest, for the premium offered by the Massachusetts Society for the Promotion of Agriculture, for the best experiment in mowing with machines worked by horse or ox power, was held at Dedham on Tuesday last. A very respectable concourse of people assembled to witness it, but not half as large as the rarity of the exhibition and the importance and value of the invention warranted. Something of this deficiency was owing probably to want of information. A few small circulars had been distributed among distinguished farmers, which amounted to almost nothing, as public notice, and the advertisements and communications in the county papers, so far as a considerable portion of the inhabitants were concerned, might have as well been printed in Kamtschatka. Some gentlemen from Worcester and Essex, interested in agricultural pursuits, were present, and contributed much to the interest of the occasion. The following are the entries for the premium of the Massachusetts Society:—

W. T. G. Morton, of Needham, S. Allen's patent.

Fiske Russell, of Boston, his own patent.

James A. Howe, of Boston, Ketchum's patent.

John Dean, Dedham, Ketchum's patent.

Alvan J. Fisher, Dedham, same patent, single horse.

J. P. Adriance & Co., Worcester, Manny's patent, four feet cutter.

J. P. Adriance & Co., Worcester, Manny's patent, single horse.

J. P. Adriance & Co., Manny's patent, four feet eight inch cutter.

Hiram W. Jones, Dover, Ketchum's patent.

Mr. Eaton, of Dedham, entered and operated one of Ketchum's machines, for exhibition, and not for premium.

The lot selected was a level plain of about ten acres, the surface being somewhat uneven in many places. The soil was light and poor, from long neglect. The crop was a thin one, of May grass or Rhode Island redtop. It was such as would have been difficult to be mown by a scythe in a dry time.

The first scene consisted of six machines put upon half-acre lands, numbered from one to six. The time occupied was from twenty to twenty-five minutes.

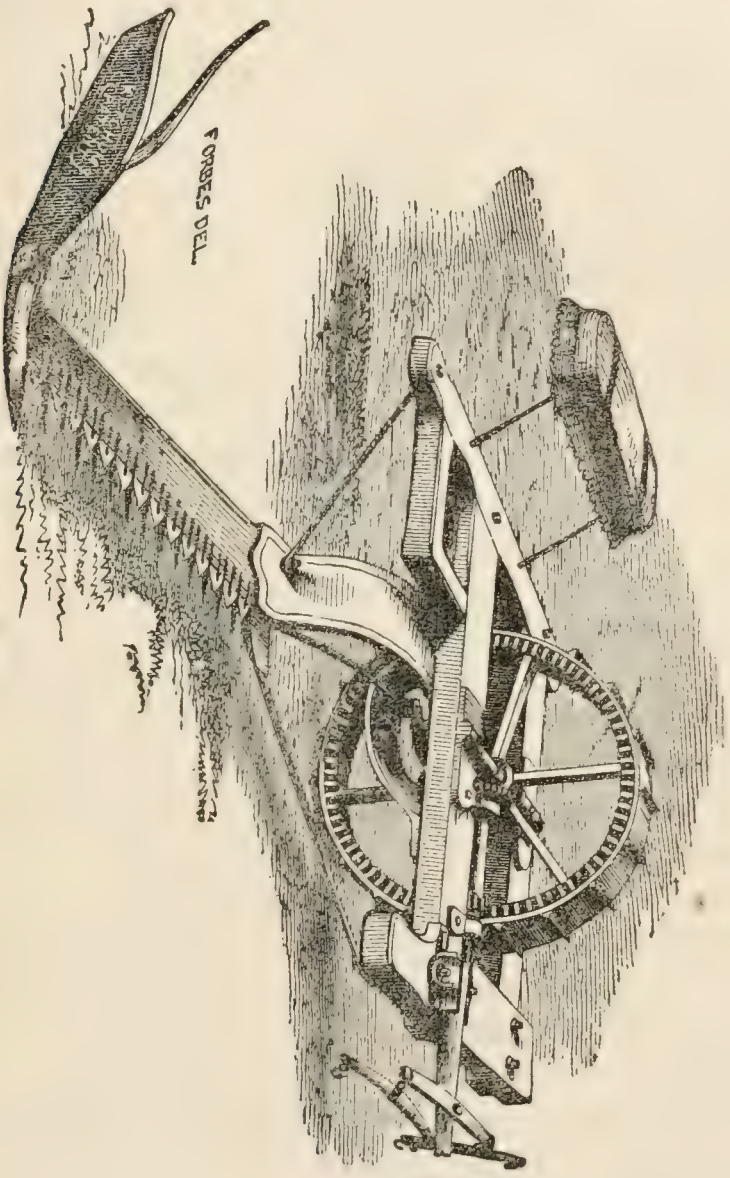
Allen's machine had lot number one, and was the first to complete the work. It is a simple machine of about five hundred and twenty-five pounds weight. It seems to have been an old one, considerably used, and somewhat out of repair. It did not mow as closely as the other machines, although the bar which held the knives appeared to run very near the surface. Mr. Morton, the possessor, was not present, and the general impression appeared to be that the machine had not enjoyed quite a fair trial, even for a single field; and it is clear that the machine which may do best execution in one kind of grass, may utterly fail, in comparison with others, in a field of a different kind.

A subsequent trial of Allen's machine was witnessed by a portion of the committee at the farm of Mr. A. D. Weld, in West Roxbury, which gave much better satisfaction. One of the proprietors was present, who understood its management, and the work was performed as well as by any machine in the list that has been exhibited to the committee.

Russell's came next, and it was also the next in time. It is a wood frame, (and rather heavy for wood, weighing about seven hundred and eighty pounds,) with a wheel in addition to the driving wheel, affording the means of travelling without cutting—an advantage of an essential character in the convenience and economy of a farm. It is thought to be best adapted, from its weight and steady motion, to heavy grass; but the appearance of its half acre was hardly surpassed by that of any other. This was one of the machines which had the fortune to enjoy a double test of its capacity on the same day. With a heavier crop and different kind of grass, in the park of the court house, it turned out very beautiful work. The reputation of this machine improved as the hours of the day passed; and it is not improbable that some who were inclined to slight

it in the morning, turned towards it with different views at the close of the exhibition.

The three following lots were occupied by machines manufactured after Ketchum's patent.



Ketchum's Mower.

This machine, we have reason to believe, has heretofore held precedence. It has been longest in the field, and, to some extent, occupies the position of general favorite. It is iron, and without any wheel but the driving one, which, together, augment the burdens of the team. It cut a wider swath than any other machine engaged in the half-acre contest. It cut a smooth, and comparatively even swath, and spread the grass

well. It preserved its ancient reputation very well in the trial, although the impression very generally prevailed, that it had been surpassed in several points: for example, by the Manny machine, in the lightness and facility of its motions, and by the Russell machine, in the closer shaving and the more even surface of stubble, after the passage of the knives. This supposition was confirmed by the operation of a machine of this patent on the west of the court house, while the Russell was performing on the east side. It mowed imperfectly, as if the knives had become dull. The gentleman who had purchased the hay, that was to be, was led, by the circumstance, to intimate that he should not obtain quite as much as legitimately belonged to him. It is not our purpose to intimate that the Ketchum patent suffered in general reputation on the occasion, as "accidents will happen in the best-regulated families." The mowing machine, although it was known in England a century and a quarter ago, is still but a new and imperfect thing in our country to-day. Its lever power is yet to be vastly multipled, and locomotive facilities are yet to be greatly increased, before it will become that perfect blessing which some, and especially those engaged in its manufacture, claim it to be. Vaucanson, the silk-loom inventor and improver, of Lyons, was a greater man than Jacquard, who distinguished himself in the same line; but it was necessary for the perfection of his instrument that the latter should live and labor after him.

The sixth half-acre lot was occupied by a machine of Manny's patent, manufactured and entered by J. P. Adriance & Co., of Worcester. It was a medium size—between the single-horse machine of three-feet cutter, and the largest of their manufacture, which has a cutter of four feet and nine inches. This machine, like all, we believe, of the same patent, on the ground, was made with a reel. It moved with such facility, and with such comparative ease, at the tread of the beautiful and finely trained horses attached to it, that it appeared more like an ancient war chariot—moving at a peaceful triumph where the victories of Ceres instead of Mars were celebrated—than a simple weapon of the farmer. The spectators seemed at once to be charmed with its performances, and for a time, at least, it took the lead in the popular estimation. The machine, great as are its real merits, was fortunate in its proprietors and managers, who were

gentlemen both in appearance and manners, and were thoroughly trained to their business. So, too, were those beautiful animals which, after performing an extra quantity of labor on and off the field, were permitted to be attached to all the other machines that had entered for premiums, and to be guided by strange drivers, in order that a system of trial might be adopted which would prevent them and others from gaining credit to their machines, on the ground of the efficiency and training of their teams and drivers. On a close examination, however, of the work after raking, it was found that it was just about on a parallel with the work of the machines of the Ketchum patent, when on their good behavior, but with a narrower cut, in two swaths of about eight inches.

Scene the Second.—Each of the teams and machines, as above, one after another, proceeded to cut a double swath through the field, a distance of more than forty rods. The general characteristics exhibited at this trial were not widely different from those presented in the former trial. It may, however, be stated, that it was in this experiment that the Russell machine, although unfortunate at the start, made the best work of any machine on the ground during the day.

Third Scene—A trial of the Single-horse Machines.—Machines of this character were present, of the Ketchum, Manny, and Russell patents. The cutters, being more limited than those attached to the two-horse machine, served to obstruct, to some extent, that easy play and freedom of action, which characterized the larger machines. Although they did not seem to execute much more than half as much as the larger machines, they seemed to require two-thirds as much power to drag them. The result was, according to our observation, that while, previous to the trial of the single machines, there was a general desire to see their performance, after it was concluded there was an equally general disappointment. When the machines shall have become perfected, as they will be in the course of years, a single horse will be able to manage them in a manner that will satisfy such expectations as were last Tuesday aroused, only to be disappointed.

Fourth Scene.—The beautiful and well-trained horses of Adriance & Co. were successively harnessed to the several competing machines, and made a *bout* under the hand of the vari-

ous drivers, who had officiated when their own horses were employed.

The whole affair was impromptu. The conditions of the premium were broad and unrestricted. A full half of the spectators had probably never seen a mowing machine before, and not one in five ever before saw one in operation; and it was doubtful, at one time, if the grass would be visible when the day of trial came. But a kind Providence, with its rains and numerous merciful interpositions, caused a result which should satisfy all the wise and moderate who were present on the occasion.

NEAT STOCK.

MASSACHUSETTS.

Report of Mr. Motley to the Trustees of the Massachusetts Society for Promoting Agriculture.

Gentlemen:—I have the pleasure to report to you the good health and condition of the Jersey cattle belonging to the society, under my care.

This breed has, I think, steadily gone on to be more and more esteemed, and must number more in this State now than any other blood stock. The number of this breed, at the late exhibition of the United States Agricultural Society, exceeded all others excepting the Devons. A bull and cow of our stock has been presented to the Board of Agriculture, for the State farm at Westboro', and the president of the society presented to the farm a full blood Jersey bull, for which the Board of Agriculture have expressed their thanks in behalf of the State. The experiment I consider as entirely successful as to the power of their enduring our climate, and that the cross with our common stock will prove the best milking stock of the country.

The importation of these animals has been kept up by various individuals every year, so that the number of Jersey cattle, by

CAPTAIN.

Jersey Bull, owned by the State.

See Preface.

the natural increase and importation, must be now many hundreds, and the demand for them is increasing.

West Roxbury.

[The following report has been forwarded to the trustees by the committee on Dairy Herds of not less than six cows, for which the Massachusetts Society for the Promotion of Agriculture offered premiums, to be competed for jointly by Plymouth and Barnstable counties.]

No one person presented six cows for premium, in Barnstable county, leaving the field to two competitors in Plymouth county, Mr. Sidney Packard, of East Bridgewater, and Mr. J. L. Bassett, of Bridgewater, who presented each six cows, owned by them more than six months previous to the exhibition, and in all respects complying with the conditions required. Confined as we are to these two competitors, the committee were much gratified to find even two herds of dairy stock in the county so wisely selected for size and adaptation to the soil and circumstances of the owners. If they did not make as much show as the larger and more prominent stocks, they were better calculated for good returns at the end of the year. Mr. J. L. Bassett's cows were well selected and bore marks of judgment and experience. They were raised in Kennebec county, Maine, and notwithstanding they are native stock, except two which have some Durham blood, they bear evident marks of being descended from a bull imported by Benjamin Vaughan, Esq., some fifty or more years since. These cows have not been high bred or high fed. The fault of Mr. Bassett has been in keeping them in winter exclusively on corn-fodder, oat straw, and meadow hay, cruel feed in winter for milch cows. Mr. Bassett's statement, which is enclosed, says the average yield of milk of his cows, for the first eight days in June, was twenty-six and three-fourths pounds, the average eight days in September twenty-four and three-fourths pounds, or equal to about twelve quarts of milk per day for each cow, with no feed but grass, his pasture none of the best. These cows were intended for making butter, rather than for large quantity of milk, the quantity of butter he has not stated. I think he said some of them made ten pounds a week, or more. If he had kept his cows better during winter, they would have made him more butter in summer. Mr. Sid-

ney Packard, of East Bridgewater, presented six cows, which he denominated Galloways; they are polled, or hornless. They were bred by himself from a cow now in his possession, thirteen years old, the dam of which was imported by a brother of the late Bartholomew Brown, of East Bridgewater, to whom the imported cow was given by his brother who imported her. They bear the distinguishing marks of Galloways, in their heads and horns, but they have no marks of the black hides of the real Galloways. The committee presume the cow from which these descended was brought from the county of Suffolk, in England. There was a race of polled cows in that county, which were celebrated for their milking qualities above all others in England. These cows bear evident marks of care and good keeping, and of being good milkers. We have never seen six cows in a herd that, in size, form, and adaptation to the soil of New England, seemed to give greater satisfaction for all purposes which a New England farmer should have in view. The imported blood must have been of a superior milking breed. Their superiority is not from the great quantity of milk they give in a single day, or a month or two, in the best of the season; but in the quality and disposition to give a good quantity the year round.

Mr. Packard's statement, herewith submitted, says the average quantity of milk given by his cows, for the first eight days in June, was twenty-seven pounds. The average eight days in September, twenty-seven and one-half pounds. The reason for his cows giving more in September than in June is, that one of his cows calved in August, and consequently was nearly dry in June, giving but nine and one-half pounds per day. The average time his cows were dry was twenty-seven days, none over six weeks, while some gave milk the year round. Mr. Packard kept his cows in the barn all the time in winter, except warm days they were turned out. They were fed in winter on English hay, two quarts of shorts and one of meal each, per day, while they gave milk. In midsummer they had no addition to the grass feed, which was not more than middling, and one feed of corn stalks—and after the first of September they had two quarts of shorts per day. Mr. Packard has not stated the quantity of butter his cows made. The committee are unanimous in opinion that these two gentlemen are entitled to premiums.

There are no cattle among the imported stock that have been bred for the pail, and none that excel, except it be the Jerseys. And the committee cannot recommend these to farmers, as suitable farm stock; they may excel for those who keep a single cow, or for amateur farmers, but for all purposes as stock they are inferior to all others. The fine cattle of England have been bred for beef; quantity, quality, and early maturity, has been their mark, consequently foreign bloods are not to be relied on for great milking qualities. Exceptions there are among all classes, exceptions there ever must be. It seems strange that no attempt should have been made to raise up a class of pure blood milkers. We know but of one in existence, that of Col. Jaques, of Somerville, who, about thirty years since, undertook to produce a new and distinct breed for milkers, from his famous bull Cœlebs, and a native cow; how far he has succeeded we have no knowledge, except from a transient view of some of his stock. They were of excellent form, bone, color, and fine to the hand, and of a size between the Durhams and Devons. If these cattle, that are as certain to produce their like as the best English bloods, are not so much esteemed as they deserve to be, it must be because the Col. has not made his experiments profitable to himself. The attempt to breed upon scientific principles exclusively, with our common native cattle, has not been made. There are said to be native cows among us descending from a line of ancestry of thirty years' standing of extra milking qualities. If such be the fact, they form a starting point for a blood stock from which we might hope for a better milking breed than has yet been produced.

Premiums for the best cow may tend to make men more wise in the selection of cows, to learn the points developed in good milkers, but of no great benefit, on the whole, while the great mass remain of such mixed blood as to insure a thousand poor animals to one good one. The subject is copious and fruitful.

Your committee refrain from further remarks.

Seth Sprague,
Benjamin Hobart,
Committee.

ESSEX.

From the Report of the Committee.

Dairies.—One entry, only, of seven cows, was made by Wm. F. Porter, of Bradford. The committee regret that others who unquestionably might have presented specimens worthy of inspection, and entitled to take place in competition for the liberal offer of the State society, did not feel interest enough to exhibit them. They hope that future years will witness entries enough to give an opportunity to those who have charge of this branch of the society's operations, to institute comparisons and make a selection, and that the example of Mr. Porter, who appears to have bestowed such wise and careful attention on this important department, will be followed by others, the fruits of whose skilful management would present claims to consideration, and enrich the exhibitions of the anniversary.

Mr. Porter is to be ranked among those observing, intelligent and practical men, whose exertions are contributing to promote the improvement and extend the reputation of the agricultural interest.

Milton P. Braman, *Chairman.*

Statement of William F. Porter.

I offered for the State society's premium seven cows, one only of which I raised, called Madam Taylor, six years old the fourth of March last, full-blooded Durham; she had her first calf at two years of age.

Black, fourteen years old, called when I purchased her seven years since, at Wilmington, Vt., three-fourths Durham.

Red, eleven years old, native, raised on the town farm in Haverhill. I have owned her four years last January.

Moss, twelve years old, supposed to be Durham. I have owned her four years last January.

Webster, seven years old, native, came in a drove from New Hampshire. I have owned her four years last January.

Cherry, six years old, native, came in a drove from New Hampshire. I have owned her two years.

Quigg, six years old, raised in Chester, N. H., called three-fourths Durham. I bought her in March last.

Madam Taylor, calved	Feb. 1, 1855,	and was served	May 14.
Black, calved	Mar. 26, 1855,	"	"	July 1
Red, "	Sept. 7, 1854,	"	"	Jan. 26, '55
Moss, "	Nov. 28, 1854,	"	"	Jan. 15, '55
Webster Aug. 19, '54, again June 25, '55,	"	"	July 20
Cherry, calved	Jan. 22, 1855,	"	"	July 6
Quigg, "	April 15, 1855,	"	"	July 11

In winter they were kept in a warm, well ventilated stable, night and day, except when turned out to drink about 8 A. M. and 4 P. M. I use no bedding, but sweep the leanto night and morning. Their feed consists of one-half good hay and one-half corn-fodder and salt hay, about equal proportions. Those giving milk had each one bucket of corn-fodder and salt hay cut and wet with four quarts of water, and three pints of corn and cob-meal, night and morning. They were turned to pasture May 21 ; after that they had no other feed except what salt hay they would eat night and morning, until the first of June, then pasture feed only until June 25th, when they had as much green oat-fodder as they would eat, night and morning, until July 23d, consuming during the time less than the growth on one-half an acre ; from that time to the present they have had as much green corn-fodder as they would eat, night and morning. The pasture contains forty acres, and is hardly an average of the pastures in this vicinity, nearly one-half of the surface being covered with bushes and brakes, the other is high, dry land, with good running water in the pasture.

The milk has been carried to Haverhill village, one and one-quarter miles every morning, Sundays excepted,—usually supplied on Saturday evenings,—and sold to customers at five cents per quart, (beer measure,) except eight days in April, when it was six cents per quart, at which price it begins again October 1st. An accurate account has been kept daily of the quantity sold, always carrying an even quantity, reserving the remainder for my family's use, varying from one pint to three quarts per day, of which no account has been kept. I have

weighed the whole quantity given in one day once each month, and found the average weight to be ten pounds and twelve ounces per gallon. Amount of milk sold as per table below. The trial commenced April 23, 1855.

Date.	Galls.	Date.	Galls.	Date.	Galls	Date.	Galls.	Date.	Galls.	Date.	Galls.
Apr. 23	13	May 1,	14	June 1,	18	July 1,	20	Aug. 1,	15	Sep. 1,	12
" 24,	13	" 2,	14	" 2,	18	" 2,	20	" 2,	15	" 2,	11
" 25,	14	" 3,	14	" 3,	18	" 3,	19	" 3,	15	" 3,	11
" 26,	14	" 4,	14	" 4,	18	" 4,	19	" 4,	15	" 4,	11
" 27,	14	" 5,	14	" 5,	19	" 5,	19	" 5,	15	" 5,	11
" 28,	13	" 6,	15	" 6,	19	" 6,	19	" 6,	14	" 6,	11
" 29,	14	" 7,	15	" 7,	19	" 7,	18	" 7,	14	" 7,	11
" 30,	14	" 8,	15	" 8,	19	" 8,	18	" 8,	14	" 8,	11
		" 9,	15	" 9,	19	" 9,	18	" 9,	14	" 9,	11
		" 10,	16	" 10,	19	" 10,	18	" 10,	14	" 10,	11
		" 11,	15	" 11,	20	" 11,	18	" 11,	14	" 11,	10
		" 12,	15	" 12,	20	" 12.	17	" 12,	14	" 12,	10
		" 13,	15	" 13,	20	" 13.	17	" 13,	14	" 13,	11
		" 14,	15	" 14,	20	" 14,	18	" 14,	14	" 14,	10
		" 15,	15	" 15,	20	" 15,	17	" 15,	14	" 15,	10
		" 16,	15	" 16,	20	" 16,	17	" 16,	14	" 16,	10
		" 17,	16	" 17,	21	" 17,	17	" 17,	13	" 17,	10
		" 18,	16	" 18,	21	" 18,	16	" 18,	13	" 18,	10
		" 19,	16	" 19,	21	" 19,	16	" 19,	14	" 19,	10
		" 20,	16	" 20,	21	" 20,	16	" 20,	13	" 20,	9
		" 21,	16	" 21,	21	" 21,	16	" 21,	13	" 21,	9
		" 22,	16	" 22,	21	" 22,	16	" 22,	13	" 22,	9
		" 23,	16	" 23,	21	" 23,	15	" 23,	13		
		" 24,	16	" 24,	21	" 24,	15	" 24,	13		
		" 25,	17	" 25,	20	" 25,	15	" 25,	12		
		" 26,	16	" 26,	21	" 26,	15	" 26,	12		
		" 27,	16	" 27,	20	" 27,	15	" 27,	12		
		" 28,	17	" 28,	20	" 28,	15	" 28,	12		
		" 29,	17	" 29,	20	" 29,	15	" 29,	12		
		" 30,	17	" 30,	20	" 30,	16	" 30,	12		
		" 31,	18			" 31,	16	" 31,	12		
Total,	109	Total,	482	Total,	595	Total,	526	Total,	418	Total,	238

Total measure and weight of milk for one hundred and fifty-three days, as follows:—

April, 8 days,	. .	109 gallons.
May, 31 "	. .	482 "
June, 30 "	. .	595 "
July, 31 "	. .	526 "
August, 31 days,	.	418 "
September, 22 days,	.	238 "
		2,368 gallons, or 25,456 lbs.

Webster gave five quarts per day to the time she dropped her calf, June 25th, and the third day after she gave eighteen and one-half quarts, and averaged more than sixteen quarts for the next thirty days. Her calf, which I am raising, had for the first month four quarts of milk per day, since that time two quarts per day, which has not been taken into consideration in the above account.

The two cows that calved, viz. :—Red, September 7, 1854, and Moss, November 28, 1854, are the best milkers of the seven. They are nearly dry now, and are with calf, to come in October 15th and 26th. I think if five out of the seven had come in the 1st of April, they would have given as much or more milk during the trial than the whole seven have.

In April, 109 gallons at 24 cts. per gallon, . .	$26 16
From May 1 to Sept. 22, 2,259 gallons at 20 cts., .	451 80
	$477 96

I think the expense of marketing the milk has not exceeded what it would have cost to have made the same into either butter or cheese, including making sale of same.

Bradford, September 25, 1855.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Report of the Committee on Stock, in 1854.

Your committee, in addressing themselves to the duty imposed on them, have not been vain enough to imagine that they were more enlightened than all others who had preceded them in the same field of inquiry; and they have accordingly perused with respectful attention the reports of the committees on stock in the several counties of the Commonwealth for some years past. There is, in these reports, not a little difference of opinion on points respecting which it is of the utmost importance that the truth should be arrived at, and, if possible, unanimity prevail; because it is only on the universal conviction of the superiority of some one system over all others, that its general adoption can be hoped for; and until this is attained, there will always be, to some extent, a perseverance in the less enlightened practice of by-gone days; and this little leaven of igno-

rance or prejudice, will in its evil influence, leaven the whole lump, and prevent improvement becoming national; and until this point is reached, the "*ultima Thule*" of agricultural ardor will not be attained. In times past a holy horror was felt at any sort of novelty; it was to the ignorant, a stumbling block, and to the prejudiced, foolishness. Indeed up to a late period, a dogged adherence to old customs has been the rule, and any departure from it the exception; the advocates for progress wish the reverse to be the case.

Foremost in importance among these points of difference of opinion, is the question of breed; for in proportion as this is rightly understood, or misapprehended, will depend the degree in which good is diffused, or evil disseminated. The saying that "like begets like," is no doubt as true as it is trite; but the misfortune is, that we do not know the quality of that which is to be begotten; for it may be safely said, that had we possessed this foreknowledge, many a poor hybrid anomaly would have been saved any participation in the ills that flesh is heir to, and spared the disagreeable necessity of ultimately dying a violent death at the hands of some ruthless butcher. There are those who cling with an amiable, because a sort of patriotic fondness, to stock, particularly cows, of the so called native breed; and it is unquestionable that many of this denomination are very useful and valuable animals; but it would be unwise to adopt these or any others about whose parentage and descent we know nothing, for the purpose of breed; for how could we tell what diseases or imperfections we might be instrumental in transmitting to their posterity? We have heard of a man, who on being urged to do something for the good of posterity, rejected the appeal by asking, "what did posterity ever do for me?" But in the case we are speaking of, we not only inflict evil on the descendants of the animal, but also on our own; and therefore, on the score of that meanest of all impulses—pure selfishness—we have an argument in favor of our doctrine, which, as Lord Bacon says, "comes home to every man's bosom." There is an English poem, written by the unfortunate Richard Savage, (the title of which, out of compliment to the unquestionable legitimacy of all present, we will omit,) in which the author makes it the boast of his hero, that he is

"No tenth transmitter of a foolish face;"

—this may be a very comfortable reflection, but the farmer who purchases stock indiscriminately, without a knowledge of the pedigree, stands a very fair chance of having bought—some tenth transmitter of a rotten race.

It should be borne in mind that morbid affection is not uniform in the time of its development, any more than is personal resemblance; it is frequently latent and inert for one or more generations; but, although it has these periodical slumbers, it always awakes, and perhaps, like a giant refreshed with sleep, only to reappear in a more malignant phase. It is with blood as it is with gold;—if you have some of the latter twenty-two carats fine, with two of alloy, you may fuse and transfuse from crucible to crucible, but you cannot transmute the baser material into gold. The fact is, the peculiarities of an ancestor may be developed sooner or later, and therefore, there is no certainty but that the offspring of a very valuable animal, whose pedigree is unknown, may be worthless.

Your committee are fully convinced that the wisest plan is to seek for animals of pure blood on both sides, for, to adopt the language of our honorable president, when he was chairman of this committee in 1851:—"In a long course of breeding, in a direct line, no intelligent breeder will resist the conclusion, whether it be in cattle, horses, sheep or swine, that the characteristics of the sires and dams will be imparted to their progeny;" but he adds, "breeding from close affinities should be avoided, for the result of it must be impaired constitutions." When, however, this cannot be attained, your committee say, by all means let a full blooded sire of one of the best breeds be used, in order to obtain the most valuable cross.

President Dwight, in his travels in New England, mentions that the town of Durham, in the State of Connecticut, had been distinguished many years for a very fine breed of cattle. Two oxen presented by some of the inhabitants to General Washington, furnished a dinner for all the officers of the American army at Valley Forge, and all their servants. These oxen were driven almost five hundred miles, through a country nearly exhausted of its forage, yet one of them, a steer, five years old, weighed two thousand two hundred and seventy pounds. Brave men lived before Agamemnon; and it appears they had good steers in those days. Well, gentlemen, the coincidence in

the name of the town and that of the noble breed of animals we esteem so highly, induced your committee to write to Durham, and inquire the breed of those spoken of by President Dwight. Here is the answer:—

"DURHAM, Oct. 9, 1854.

Dear Sir:—They were our native breed, improved by some of our best farmers to a state of great perfection; since which they have deteriorated, and we have not had their equal since."

Here is a proof of the evil of breeding in and in;—it ends in running out and out.

Allowing to the Devon, Hereford and Ayrshire breeds their respective quotas of merit, your committee have no hesitation in pronouncing in favor of the short-horned Durham, as the breed most profitable, first to the farmer, and eventually to the butcher. The great feature that entitles the short-horn Durhams to the pre-eminence is, that they yield more value in milk and flesh in proportion to the food consumed, than any other breed. The late Thomas Bates, of Kirkleavington, England, (owner of the ancestor of the noble animal of that name which you have seen to-day,) said, "that after a fifty years' experience, he selected the Duchess tribe of short-horns, as superior to all other cattle, not only as small consumers of food, but as great growers and quick grazers, with the first quality of beef, and also giving a great quantity of very rich milk." Here, then, we have economy of food, rapidity of growth, activity of feed, richness of material, and lacteal wealth:—surely, the force of eulogy can no farther go,—praise can take no higher flight.

JOHN EDEN, *Chairman.*

HAMPSHIRE.

Report on Stock.

In the range of subjects embraced in rural economy, there is none of greater importance to the farmer than that assigned to this committee. The word stock, in agriculture, includes all the domestic animals, from the Bantam fowl to the most beautiful and elegant horse of the Black Hawk breed. To treat of this subject by presenting a report containing suggestions con-

cerning all these various genera and species, with their almost infinite varieties, is not expected: for the subject has been classified, the labor divided, and given to different committees. This committee is expected to treat specifically of neat stock, or cattle.

The animal kingdom is divided into orders, genera, and species, the latter including varieties, races or breeds, which include animals of the same species, being essentially alike, differing only in minor characteristics, caused by climate, food, and care in breeding. Species designates animals that are alike in character, possessing power of reproduction, however unlike in general appearance these races may be. Compare the elegant, thorough-bred short-horn, or Durham bull, with the most diminutive "scrub," and no one will fail to observe the striking difference; yet the general specific characteristics are the same. The difference is the result of careful attention in breeding.

The word breed means a progeny descended from the same stock. It is an old maxim, founded on a well-known, fixed law of nature, "that like begets like." A breed of cattle, therefore, includes a race or variety, as the Devon, or Hereford breed. These have fixed qualities that are well-known and understood by stock breeders—qualities that can be, with the certainty of a well-known law of the animal economy, communicated to their progeny. This law is everywhere confirmed in the history of domestic animals. The Merino sheep furnish a striking illustration. So does the Arabian horse. "Native cattle" cannot, according to this definition, be called a breed; for they are destitute of the *marks* of breeding, as here indicated, which are agreed to by stock breeders. But, says the objector, if admitted "that like begets like," is not this law as true of natives as of well-bred cattle? Undoubtedly. The uncertainty lies in this: no one can divine whose likeness the progeny will be, whether that of the bull or some one of his "scrub" ancestry, with which his blood is mingled.

In view, then, of the fact, that about three-fourths of the farming capital is invested in stock, stock-feed and stock accommodations, the subject of stock-breeding and raising becomes, at once, a matter for careful and intelligent consideration by every farmer, who wishes to make this part of his business as profitable as possible. This brings up the subject of breeds, or

no breed, or of well-bred and native cattle. Both the natives and the thorough-breds have their advocates and their contemptuous revilers. Now, what every enterprising farmer wants to know is, whether it is better for him to invest in native or well-bred stock, or both; also, to inquire concerning the different breeds, all of which have their enthusiastic advocates; whether it is better to keep them pure, or to cross with natives. Instead of fully discussing these various topics, as the committee would gladly do, it can only make a few suggestions, which it is confidently hoped will serve to awaken a greater interest and desire in the Hampshire society farmers, to improve their stock, and thus receive more liberal dividends for money thus invested.

Notwithstanding the intention of the committee to enumerate the various breeds of cattle in England, giving their general characteristics, &c., it is deemed inexpedient to do so now. Those most popular in this country are the Jerseys, (sometimes called Alderneys,) Devons, Ayrshires, Herefords and Durhams, names indicating that part of England where the breeds were cultivated and improved. In determining which of these is best, or which is most desirable, the inquiries come up, whether you want to breed cattle for the shambles, the dairy, or for work, or for all these purposes.

Of these different breeds, the Durhams, or short-horns, are by far the most elegant and beautiful of the cattle kind. They are the dukes, or the first order of nobility of all the well-bred animals of the bovine races. For the shambles they have no equals; for work and travel they are not excelled. Says a gentleman who purchases oxen for quarry work, in a neighboring State, after an experience of twenty years, "I have never seen the grade short-horns excelled." "As a breed," says another, "the short-horns are remarkable for their milching qualities." "Grade short-horns are almost universally good milchers." Yet it is said, by the advocates of other breeds, that the Durhams are deficient in both milching and working qualities. The milching qualities of a breed may be transmitted to their progeny, with as much certainty as those of form or color. This may have been neglected by some Durham breeders, and thus have furnished occasion for this remark. Yet every well-informed stock breeder knows that there are excellent milchers among the short-horns. In fine, there is no doubt that the

improved short-horns, when well fed, are the most profitable breed of cattle known.

The committee, having enjoyed an opportunity of attending a large number of county and State fairs, may be allowed to give some of the fruits of personal observation, the present season.

In Western New York, at the Monroe county fair, the Devons greatly predominated over all other breeds. At the Ontario county fair, held at Canandaigua, the Durhams far exceeded all others, both in number and quality. Here was exhibited about forty head of fine, thorough-bred short-horns. Some of them were from the herd of the late Henry Clay. A cow and calf were sold here at auction for over four hundred dollars. Many other animals of this breed were sold for higher prices. At the Livingston county fair at Genesee, the short-horns bore off the palm. This was deemed the best county exhibition of stock in the Empire State. The grade stock was exceedingly fine. At the New York State fair at Elmira, the Durhams were more numerous and excellent than those of any other breed. There were but few Herefords, Devons, Ayrshires and Jerseys. At the Illinois State fair, in Chicago, the Durhams far excelled all others, in elegance, beauty and numbers. Of all the exhibitions of stock seen during the past autumn, as well as those observed on all former occasions, none equalled the stock show at the Illinois State Fair. The most celebrated stock breeders in the "Garden State" are J. N. Brown, Esq., and Col. Dunlap, the former of Sangamon county, and the latter of Morgan county, both of Central Illinois. Mr. Brown has about fifty thorough-bred short-horns, and about five hundred head of grades and natives. Mr. Dunlap has also a large number of thorough-breds. The stock of these two enterprising farmers attracted much attention. If any of the readers of this report should be moved to procure a fine and elegant pair of thorough-bred Durhams, the committee can refer them to no better man to fill such an order than James N. Brown, of Island Grove, Sangamon county, Illinois.

The Devons are deemed a good breed for poor farms, and short feed. It is said that the native cattle of this country have a strong infusion of the Devon blood, being mingled more or less with that of various other races of the small breeds. Their

color is a mahogany red. They are sometimes called "improved natives."

The Herefords are a large breed, and highly recommended by some breeders for dairy and work. Their color is a dark red, or reddish brown, with white faces, with more or less white on the back and belly. The Durhams are gaining in the home of the Herefords, thus showing that their superiority is acknowledged, even by the breeders of Herefords.

The Ayrshires possess excellent dairy qualities. Mr. Ayton describes them as a puny race, in his work on "Dairy Husbandry," published in 1825. "They are mostly of a black color, masked with white on the face, back and flanks,—few of the cows yielding more than from a gallon and a half to two gallons of milk per day, in the best part of the season, and, when fat, weighing not more than twenty stones." Their blood is mingled with that of the Alderneys. The cows are very hardy, docile and gentle, and will subsist on ordinary food. Few steers of this breed are reared for grazing. "Those, therefore, who suppose that the Ayrshire breed combines the properties of dairy and grazing stock, entirely mistake its distinctive character. For dairy purposes it occupies a high rank, like its kindred, the Jerseys; and, like the latter, an inferior place for grazing and fattening."

The Alderneys are famous only as milchers. They are a small and ill-formed race. The color of this breed is, usually, a light red or fawn, mixed with white; but individuals may be found that are black, mixed with white or dun, and sometimes cream-colored. To preserve the purity of this race, "a law was enacted, in 1789, and is still preserved on the statute book, by which the importation into Jersey of any cow, heifer, calf or bull, is prohibited, under the penalty of two hundred livres, with forfeiture of the boat and tackle; and a further penalty of fifty livres is imposed on any sailor on board who does not inform of the attempt. The animal itself is to be immediately slaughtered, and its flesh given to the poor." This breed is supposed to be of Scandinavian origin.

The committee would gladly enumerate the qualities of the Glamorganshire, Sussex, Galloway, Kerry, and other breeds, were it deemed practically necessary. The best breeds have

been named, and scarcely more, not for want of matter, but for lack of space to enlarge.

Determining on the most valuable breeds, mentioned according to the true test, not by the profits yielded between buying and selling, but by that which it yields, says Low, to the breeder and the feeder, conjointly, from its birth to its maturity: this being the test, the short-horns, or Durhams, merit what has been most justly awarded to them, the preference over all other breeds known to stock breeders and graziers.

It having been unanimously decided by both practical and scientific observers, that "the male has far more influence than the female in fixing the characteristics of the progeny," the way for farmers to improve their stock to the best advantage is, to procure a thorough-bred bull of the breed desired. No such farmer will ever keep a grade bull, though it be superior to its well-bred sire, in form and symmetry, for remember, purity of blood is every thing in this matter. Let farmers unite, if no one feels able to procure a thorough-bred animal of the breed desired, and purchase such an one, and all will soon see the advantage.

For raising grade stock with native cows, the Improved short-horns are altogether the best; for this grade stock makes good milchers, good working oxen and good cattle for grazing and fattening. The short-horns are not, as you sometimes hear it said, universally white or nearly so. They are seen of every variety of color, that can be made by mixing red and white. They may be spotted, or a roan, or a creamy white, or pure red. The hair of the well-bred animals is of a soft, silky feeling, and of a superior quality to that of any other breed.

It is hoped that others will strive to emulate the worthy example of Prof. Fowler and L. Sweetser, Esq., of Amherst, Paoli Lathrop, of South Hadley, and H. Hunt, of New Salem, who have procured some well-bred Alderneys, Ayrshires, Durhams and Devons. Let this work of improvement go on until every "scrub bull" of the ancestry of "Pharaoh's lean kine" shall be banished from the hills and valleys of Hampshire and Franklin counties. Let thorough-bred bulls only be employed—those whose pedigree is pure, and recorded in the herd book.

The pedigree of animals is registered in herd books as follows:—

"Logan, 95 American Herd Book, roan, bred by Paoli Lathrop, of South Hadley Falls, calved August 19th, 1844, sired by North American (No. 16 American Herd Book) Dam Louisa, by Boston, (1735, English Herd Book) Grand Dam, cow Boston by Sir Charles, (1440 do.) Great G. Dam Duchess by Wellington, (683 do.) G. G. G. Dam—by Admiral (41 do.) G. G. G. G. Dam—by Sir Henry (1444 do.) G. G. G. G. G. Dam —by Colonel (1440 do.) G. G. G. G. G. G. Dam—by son of Hubback (310 do.) G. G. G. G. G. G. G. Dam by Hubback (319 do.)," the celebrated bull from which have descended the improved short-horns of the present day.

The committee was unavoidably prevented from attending the exhibition of stock at the late Hampshire cattle show and fair. It is gratifying, however, to learn, that it was superior to any former show of cattle. H. N. Rust, of South Deerfield, exhibited a well-bred Devon bull; L. Sweetser, of Amherst, six fine Ayrshires; H. Hunt, of New Salem, exhibited two Devon bulls. There were, also, several fine grade animals; thus demonstrating the advantages of crossing the improved breeds with the common native stock. There were several pairs of grade oxen that attracted much attention.

It is hoped that another year's exhibition will include a much larger show of pure, thorough-bred animals, such as have their pedigree recorded either in the English or the American herd book. No others should be permitted to take premiums as pure blooded animals, of the breeds which they severally represent. Purity of blood, let it be borne in mind, is of the utmost importance to breeders. Committees should be judges of pedigree, as well as of points of excellence. And these are really the tests which should decide the merits of such animals. It is no matter how fine and symmetrical the form, if the animal is a bull, and not thorough-bred, do not suffer yourself to be deceived by the claims of the owner, that he is just as good for stock improvement, as any animal whose pedigree can be traced back in a direct line to Hubback; for it is not true. None but pure, thorough-bred bulls will serve the highest purpose in crossing with natives. Purity of blood is the first quality to be considered in a bull.

Leander Wetherell, *Chairman.*

ESSEX.

From the Report of the Committee.

Milch Cows.—In connection with the statement of the award of premiums, the committee beg leave to make a few suggestions. A leading object—perhaps it is not too much to say *the* leading object—of this and other agricultural societies in the State, has been to improve our milch cows. The Massachusetts society, older in years and stronger in resources than the county societies, has, at times, devoted a large part of its income to this object. Individuals, too, who were possessed of ample means and enlarged views, very much desiring to accomplish the same object, have made liberal expenditures in the purchase of improved English cattle, in order thereby to compass the end at which all were aiming—the improvement of our stock for dairy purposes. Improved short-horns were introduced long ago. Ayrshires, North Devons, and to some extent, Herefords, have been acclimated in New England, for a series of years. More recently, the Island of Jersey has furnished us with large numbers of Alderneys, so that the opportunities of cross-breeding with these different varieties of imported animals are, and for a long time have been, within the reach of every farmer, whether he be rich or poor. With these means of improvement furnished to his hand, the farmer has had, in addition to the stimulus held out by the liberal annual premium lists of agricultural societies, that ever-present and most powerful incentive, his own personal interest, which, under ordinary circumstances, drives him to take advantage of every thing which in any way tends to promote it.

Great reason has there been, therefore, to expect much improvement in our dairy stock; and if the course which has been pursued is the right course to effect it, then that improvement must of necessity follow.

But how stands the fact? The expenditure of money has been enormous. Is the improvement which has been made in any degree commensurate with it? Nay, more, has any improvement been made at all? Many men, of large experience and observation, as mature in judgment as in years, incline to the opinion that there has been none.

Those who think, on general principles, that every generation grows wiser than its predecessor, and that we are wiser in every respect agriculturally than our fathers were, will probably deny this proposition. Men who have paid extravagant prices for cows, and believe that the quality depends upon the cost, will dispute it. Those who have what is termed blood stock—the meaning of which, it is sometimes said, farmers are slow to comprehend,—and who breed it for sale at enormously high prices, will dispute it. Interested individuals, in whatever way they may happen so to be; and thoughtless individuals, who are always apt to take their desire to have a thing so for an assurance that it is so, will dispute it. But if the cows exhibited at our annual show are to be taken as the criterion, then we have no hesitation in saying—no man can for a moment hesitate emphatically to say—that certainly no improvement has been made. If the milch stock of a large majority of the farmers of the country is to determine the question, then we have made none. If the number of superior cows in any particular locality, of any or all breeds, is to determine the question, then we have made none.

It is a rare thing to see a very superior cow at one of our shows,—it is much rarer that the cows in our farmers' yards will average above ordinary,—and those of the highest order of the very first quality, were as frequently met with in 1825 as in 1855. It is undoubtedly true that the product of the cows of the county, numbers being equal, is much greater now than it was then. But this does not result from any improvement inherent in the stock itself, but is the very pleasing consequence of a wiser, more humane and more judicious mode of treatment. We have probably now a hundred cows, well fed, well housed, tolerably well groomed and generally well cared for, where not a tithe of that number were so treated thirty years ago. The reasons are obvious.

That period of thirty years has witnessed the birth, (infancy it had none,) the fabulous growth, and the gigantic manhood of that great business of the county—manufacturing, in its different varieties. Within that time our population has nearly doubled, and, with the increase of population, the demand for dairy products has been proportionally increased. To use a common expression, the producing of milk and butter has paid,

and farmers generally have found that good liberal feeding produces the most milk and butter, and therefore pays best. A great many men in the county who are not farmers, or who make farming subsidiary to some other pursuit, keep cows. These feel a laudable pride in having their animals look well—and they know that cows, certainly, will not look well unless they are fed well. It is true, almost without exception, that cows kept by men who are not professed farmers, and who generally have abundant means to keep a much larger number than they do, are always maintained in good condition,—for pride and profit conspire together, and the patient, faithful cow, so indispensable to our comfort, gets the benefit of the combination. If the day ever arises when there are no exceptions to this rule, among those who make farming the "paramount interest"—to the cattle it will certainly be a day of universal thanksgiving and rejoicing.

Any increased product, therefore, is attributable to improved care and feeding, rather than to any improvement in the quality of the stock.

If, then, we have made no material improvement in the milking properties of our cows, we have been either mistaken in the direction from which improvement is to come, and have been looking the wrong way, or else we have sadly abused our opportunities. Perhaps, to a certain extent, we have done both; for it is most true that all attempts at improvement by crossing with foreign breeds, either in the county or out of it, have been without system, without aim, without judgment, without even the first idea of the principles which govern reproduction—if not without thinking that it was dependent upon any principles. The whole of it has been a mere hap-hazard run for luck, which does not rise to the dignity of experiment, even, and from which no benefit could be derived under circumstances the most favorable, or with means and materials best adapted to compass the desired object. We may go on headlong in this way as long as we please, in the blind hope that chance will solve the mystery and give us the information which we seek, and thirty years hence be found precisely where we are to-day, for the solution of the mystery chance can never give.

But if good judgment in breeding had been exercised, would success have followed it? To make ourselves perfectly under-

stood,—is cross-breeding with blood-stock the best mode of improving the dairy qualities of our cows, when that crossing is conducted upon the most approved principles? Now, although we are not prepared fully to answer the question in relation to all, we are abundantly ready to do so in relation to some of these foreign breeds.

Let us take the North Devon, to begin with, a breed of cattle which will be always attractive to the eye, for they are in the highest degree beautiful. Uniformly of the same deep red color, "in activity at work, and aptitude to fatten" they stand, perhaps, unrivalled. It is said that at their work "they have a quickness of action which no other breed can equal, and which very few horses exceed." From their reputation in this particular we cannot detract if we would, and have no desire to do so if we could. But in our admiration of the perfections of the Devon ox, we cannot overlook the faults of the Devon cow. That very rotundity of form and compact frame, with no projection of bone at any point, which makes the ox quick and hardy at his work, and gives him that aptitude to fatten, albeit to him it is the highest recommendation, to the cow it is the very strongest objection; for that peculiarity of form, however beautiful it may be, which disposes an animal at all times readily to take on fat, is absolutely incompatible with good milking qualities.

Notwithstanding this objection is apparent upon a mere inspection of the animals, there are those who would have us believe that, for the dairy, the Devons are more valuable than any other cows. It has been published almost weekly for a year or two, that a pound of butter was obtained from four quarts of milk given by a cow of this breed. Has any body learned during that time whether it took twelve, or twenty-four, or forty-eight hours to obtain the four quarts of milk from that cow? Have we seen a line anywhere from which the least information could be gained, as to how much butter that or any other Devon cow has produced in a year, or in a single week even? Upon these points our weekly monitor maintains a most ominous silence. Cattle may sell better if one desirable quality, one point of excellence, can be so magnified and made prominent as to over-shadow and conceal a multitude of defects. When our teachers of agriculture turn stock speculators, we

cannot, and ought not to expect them to be free from the imperfections which attach to poor human nature.

Youatt, a British authority not to be questioned, in his work on cattle, says: "For the dairy the North Devons must be acknowledged to be inferior to several other breeds. The milk is good, and yields more than an average proportion of cream and butter; but it is deficient in quantity." He furthermore says, "that its property as a milker could not be improved without probable or certain detriment to its grazing qualities."

But we have still a better test of the estimation in which the Devons are held for dairy purposes, both on this and the other side of the water. A scale of the points of excellence of different breeds of cattle, established years since in England, more recently adopted, with few if any changes, in America, shows the real value which the best judges (who, if prejudiced at all, are prejudiced in their favor,) place upon the Devons and other English breeds, as milch stock. This scale embraces one hundred points; and no animal, of course, attains perfection until it is entitled to the entire hundred. To each part of the animal its real value has been assigned; as, for instance, a deep, round and faultless chest is entitled to a certain number of points in the hundred—say fifteen; a faultless head to four, and so on. If the animal is deficient in any part, the number of points at which that part is rated in the scale is to be deducted from the hundred, in determining its merits.

Now the Devon cow is so lightly esteemed for the dairy, both here and at home, that the udder, whose size and shape we are apt so carefully to criticise in a milch cow, is rated in the established scale as of the value of one point, while the horns and ears are considered worth two points each, and the color of the nose and the expression of the eye have four points assigned to each. In other words, if a perfect cow of the Devon breed, with an udder such as in that breed affords the best promise of capacity and product, is worth one hundred dollars, another cow of the same blood, equal to her in all other respects, but whose udder is of such a character as to make it certain that she cannot yield a quart of milk in twelve hours, is worth ninety-nine dollars.

It is therefore apparent that the animal, the capacity of whose lacteal glands is considered only of one-quarter part as much

consequence as the color of her nose, or the brightness, clearness, and prominence of her eye; the shape and size of whose horns are of twice as much consequence as her udder, and that in the judgment of men who best know her merits—can be of little value for dairy purposes.

We may rest assured, therefore, that cross-breeding with the North Devon will never improve the stock of the country for those purposes.

The same British authority already quoted, says of the Herefords: "The Hereford cow is apparently a very inferior animal. Not only is she no milker, but even her form has been sacrificed by the breeder." Mr. Colman, when in Europe, wrote of them that, "in general, the Herefords rank low as dairy animals, and are considered inferior."

The Hereford ox, however, is of very nearly or quite as much value for the yoke as the Devon, and fattens, it is said, quite as readily, and to a much greater weight. Therein consists the entire merit of the breed, as we suppose.

Most assuredly the Hereford cannot aid in improving our stock for dairy purposes.

Perhaps it is hardly necessary to speak of the majestic, and ever to be admired Durham short-horn. If our bleak, rocky hills, and the fertile prairie bottoms of the West were transposed, the short-horns, claimed by their friends as the best breed of cattle for all purposes, and with good show of reason, would be worthy our careful consideration; but it seems to be settled, in this county at least, that our scanty pastures will not feed them.

The only British breed which we have among us besides, strictly speaking, is the Ayrshire. The Jerseys, or Alderneys, from the Islands in the British channel, hardly belong to the main land.

The Ayrshires are wonderful favorites in their own and the adjoining districts of Scotland. It is said that they always do much better in their own locality than when removed. Perhaps this is not peculiar to any breed. Some of us recollect the answer made by an old gentleman in this county, when complaint was made by the person to whom he had sold a cow, that she did not give so much milk as it was said she had done

before he purchased her. "Sir," said he, "I sold you my cow, but I did not sell you my pasture." The county of Ayr is a highly improved agricultural district.

In the scale of points before spoken of—twelve times as much importance is given to the udder of the Ayrshire cow as to the udder of the Devon cow, "because," say the judges, "the Ayrshires have been bred almost exclusively with reference to their milking properties."

The Alderneys are everywhere praised for the richness of the milk which they give. The Jersey cow Flora—imported and owned by Mr. Motley, of Roxbury—produced more than five hundred pounds of butter in less than a year. Four quarts of her milk, however, never made a pound of butter. It always took a fraction more. If, then, our cows are to be improved at all, by crossing with blood stock—it must be with one or the other of these two breeds.

Whether cross-breeding with imported stock—or a course of judicious selection for a series of years from our own cattle—be they natives or nameless, as your will—aiding this selection by a system of constant care and nutritious food, will best accomplish the end in view, your committee express no opinion. They have already to ask to be excused for extending this report to so great length. If, however, any body, anywhere shall be benefited by these suggestions, it will be a sufficient ground of pardon for the space which they have occupied.

T. E. Payson, *Chairman.*

Statement of John Perkins.

I present for examination my cow of native origin, six years old. I have owned this cow four years. She had her calf the 14th of March last; since that time, up to the present, she has given 2,829 quarts of milk. I have measured her milk every day, as I sold it to my neighbors. Her milk is said to be very good by those who use it. From the time she calved up to the 20th of July she averaged fifteen quarts per day; from that time to the present thirteen quarts per day. In June she gave seventeen quarts per day for ten days in succession; she now gives eleven quarts per day.

Their feed has been good hay and six quarts of shorts per day; when turned out to grass, only what she got in the pasture, until since the 20th of July, when she has had hay night and morning, and four quarts of shorts per day.

SOUTH DANVERS, Sept. 26, 1855.

MIDDLESEX.

Statement of Asa G. Sheldon, to whom was awarded the Second Premium for a Dairy of eight cows.

NAME.	Breed and Age.	Where raised.	When Calved.	Amount of Butter for 9 days in June.	Amount of Butter for 9 days in Sept.
1—Grey Cow, . . .	Native, 4 yrs.	Wilmington, . .	April 8, 1855, .	8 lbs.	11 lbs.
2—Beauty, ...	" 5 "	do . .	May 6, 1855, .	9 3-4 "	13 1-4 "
3—Black Nelly, . . .	" 9 "	Maine, ...	April 8, 1855, .	10 "	13 "
4—Patience, ...	" 3 "	New Hampshire, .	" 28, 1855, .	8 3-4 "	9 1-4 "
5—Spot, ...	" 5 "	Wilmington, . .	May 8, 1855, .	9 "	10 1-4 "
6—State of Maine, . .	" 7 "	Maine, ...	April 15, 1855, .	8 "	10 1-4 "
7—Black Broad Horn, .	" 3 "	Vermont, . . .	May 25, 1855, .	8 "	11 1-4 "
8—Nonesuch, . . .	" 3 "	Maine, ...	Dec. 23, 1854, .	8 3-4 "	7 3-4 "

The cow Nonesuch made also in the month of January, 1855, forty-two pounds of butter, and in the month of February, thirty-seven pounds.

The weight of milk the eight cows gave in the first nine days of June and September, was as follows:—

Date.	Morning.	Evening.	Date.	Morning.	Evening.
June 1, . .	69 lbs.	67½ lbs.	Sept. 1, . .	80.2 lbs.	85 lbs.
" 2, . .	81½ "	89¾ "	" 2, . .	73½ "	85.1 "
" 3, . .	85¾ "	93¾ "	" 3, . .	71¾ "	92.2 "
" 4, . .	78¼ "	103¼ "	" 4, . .	81¼ "	88 "
" 5, . .	73¾ "	107.2 "	" 5, . .	80 "	91.1 "
" 6, . .	63 "	106 "	" 6, . .	74¾ "	87 "
" 7, . .	75 "	98¼ "	" 7, . .	73¼ "	82.3 "
" 8, . .	74¼ "	93 "	" 8, . .	77 "	89.1 "
" 9, . .	70¾ "	104¼ "	" 9, . .	74.2 "	82.3 "
	671¾ lbs.	903¼ lbs.		686½ lbs.	763¾ lbs.

The amount of butter made from June 1 to September 10 was eight hundred twenty-five and three-fourths pounds, which was sold for thirty-five cents per pound, amounting to $289.01.

In this time there was produced over 2,000 gallons of skimmed milk and buttermilk. A considerable portion of the buttermilk and some of the skimmed milk was sold at eight, ten and twelve cents per gallon. I feel fully satisfied that my hogs give full credit for the remainder at four cents per gallon, amounting to $80.

These cows, prior to the first of June, after suckling their calves, made three hundred and eighty-nine pounds of butter at thirty-five cents, $101.15. From September 10 to September 24, they made one hundred and fifteen pounds of butter, making this, as the other has been sold, at thirty-five cents per pound, $40.25. Worth of buttermilk and skimmed milk prior to the first of June and since the tenth of September, at four cents per gallon, would amount to $40. The whole amount of butter made by the eight cows, since suckling their calves, is 1,229¾ pounds; at thirty-five cents, $430.41. Sum total of buttermilk and skimmed milk, $120. Final total, $550.41.

These cows were turned into a bush pasture about the twenty-fifth of April, and were fed at the barn with meadow hay, cut and fine feed, mixed with sweetened water, each cow being allowed three pounds of fine feed and half a pint of molasses per day; they were fed in this way till the first of June; they were then turned into a good pasture; while there was plenty of feed in the pasture no other feed was furnished them. From the last of July, through the dry weather of August and September, they have been fed on green corn, small potatoes, ruta-bagas, top stalks, and such other things as the farm could spare best.

WILMINGTON.

Statement of George M. Barrett, to whom was awarded the Third Premium for a Dairy of seven cows.

Where bred and raised.	Breed and Age.	When Calved.	Nine days in June.		Nine days in Sept'r.	
			lbs. of Butter in morning.	lbs. of Butter in evening.	lbs. of Butter in morning.	lbs. of Butter in evening.
Concord, . . .	Ayrshire—3 years, .	Apr. 12,	81.2	110.2	58	62
Dracut, . . .	Ayrshire—7 years, .	" 15,	89.2	121.2	53	62
New Hampshire,	Native—3 years, . .	" 15,	78	109	54	62
Concord, . . .	3-4 Ayrshire, 1-4 Native-4 yrs,	May 4,	91.2	126	52	59
New Hampshire,	Native—3 years, . .	" 12,	73	99.2	49	52
Concord, . . .	Native—3 years, . .	" 29,	99.2	139.2	70	81
Concord, . . .	1-2 Ayrshire, 1-2 Native-4 yrs,	Aug. 27,	73	89	138.2	157

The above cows were turned to pasture May 12; the quality of pasturing poor. No other food furnished until the first of August, since which time corn-fodder has been fed to them.

The dairy of cows which I offer for premium and inspection was taken from my herd of cows, consisting of thirty, and the only ones I could offer that would come within the rules required, as to their time of being in milk; consequently, I have had no chance to select. A number of them are only three years old, as you will perceive by the statement. They have been kept the whole season in a short, dry pasture, with no extra feed, except some corn-fodder the latter part of the season.

My statement of quantity of milk falls considerably short of what they have given in years past, such of them as have been in milk before this season, owing to the very short feed which I have had.

CONCORD.

WORCESTER.

Report of the Committee.

From the organization of this society, now thirty-seven years since, its trustees have annually endeavored, by all the inducements which the most earnest invitations and liberal premiums could offer, through the observation and experience of practical farmers, to ascertain and improve the productive qualities of the dairy stock of the county. Among the classes of animals none have been made an object of greater interest than the milch cow. Rewards, not unfrequently quite equal to her market value, have been offered for her exhibition at our shows, with no other requirement from the owner than a statement of her qualities, the product of her milking within short periods, and the value of her use. Probably, in no attempt at results has there been so little of certainty, or of satisfaction, hitherto. Either from misunderstanding of the proposals, or carelessness in their observance, or supposed difficulty in compliance with the rules, the number of competitors has annually been small, and facts, the communication of which would seem to be within the notice of every intelligent and observant dairyman, yet remain to be solicited for our reports. What the society needs, and what the agricultural community most wish to know, is, the preference which should be given, in the cow, to the different races. We have the Durham and the Devon, the Ayrshire and the Alderney, the Holderness, the Hereford and the native. Which is the most productive to the farmer? Which may he buy to the greatest profit? If one is to be preferred to all, or any other, for what properties? Is the greater richness of the milk of the Alderney an equivalent for the greater quantity of the milk of the Ayrshire? Or does the hardier character and easier keep of the native outweigh a just consideration of the earlier maturity and greater size of the Durham, or the beautiful symmetry and quiet docility of the Devon? Or in a mixture of races, and between what races, lie the better advantages of a cross? These are questions which are yet unanswered. And besides, by what experiment or comparison are we yet enabled to discriminate between races, or individuals, relatively best adapted

to the churn or cheese-press; or to declare that either race is alike profitable for both? In rural economy no department is of more importance than the dairy. But who knows, and by what instructions, shall the farmer select the best animal for his purpose? There are partialities, doubtless, for different breeds; but they are the result rather of a knowledge of particular instances of excellence, than of any general, ascertained rule, which has respect, alike to the selection, management and use of the animals. Until it can be determined which race is most bountiful in milk, and longest in the continuance of the milking season; which is most productive of butter or of cheese; which is most cheaply kept, having reference to productiveness; which produces the best calves, and ultimately will make, at the least cost, the most beef; and finally, which, in the view of all these considerations, unites the largest variety of valuable properties, and becomes the most profitable; these investigations, which the society has instituted, should not cease, and competitors for premiums should be held to make the trial and furnish the information which is required to arrive at more satisfactory result.

In the competition, at the present show, the committee have found even more cause for complaint than upon former occasions. There were certified by the secretary to have been thirty-two entries of this class of stock, a number unprecedented in any previous exhibition, in this county; yet, with the exception of three competitors, there was a total omission, on the part of the owners, to furnish certificates required by the rules in reference to the history, qualities and products of the animals, and the committee were left to judge of their comparative merits from such information as they casually gathered at the pens, and from their personal inspection. Of the number, some bore the marks of the highest excellence, while not a single one was of ordinary appearance in milking properties.

A beautiful cow of bright red color, remarkable in size and of fine proportions, one-fourth Ayrshire, entered by Mr. Rufus Carter, of Worcester, first attracted the attention of the committee. Her great yield of milk and singular productiveness came to them by rumor. She was offered for exhibition only—her owner, as was intimated, looking to higher game than the premiums of this society, which, under a late law of the legis-

lature, might exclude her from a successful competition for a greater prize in a State show hereafter.

Mr. Edwin H. Lovell, of Boylston, entered for premium a fine looking cow, half Ayrshire and half Devon, seven years old, and had he accompanied her entry, as required by the rules, with a certificate of the facts, orally stated by him to the committee, at the time of the examination, he would have been a successful competitor.

Mr. Leonard Worcester, of Shrewsbury, had two very good native cows, of the ages respectively of four and twelve years, in the pens; but he had kept no such account of their product as is prescribed by the rules, nor did his written statement, in any respect, conform to their requirement. Indeed, he frankly admitted, that he did not think of offering his cows for premium until it was too late for the June trial of their product of milk.

Two cows of Mr. Tyler P. Curtis, of Worcester, of the Durham breed—four years old, and raised in Barre—were presented by him for exhibition. They were, in appearance, among the first animals of this noble race, in the pens, and Mr. Curtis has done himself great credit, as a good farmer, in being the owner of such fine stock.

Wm. T. Merrifield, Esq., of Worcester, with his accustomed liberality and public spirit, exhibited four young cows, each four years old, of the Ayrshire and Devon cross, and the committee saw also, in the adjoining pens, several younger animals belonging to the same gentleman, which bore evidence of his careful and successful attention to the raising of fine stock. The committee felt much regret, that Mr. Merrifield, although not desirous of a premium, had not caused an account to be kept of the product of his cows. We trust, that another year will find them numbered in the competition for prizes.

Several cows, entered upon the secretary's books and inspected by the committee, were raised without the county, and were thus, by the rules, excluded from competition. Among them were some superior animals, which added greatly to the interest of this fine show. The committee especially noticed a most beautiful imported Hereford cow, five years old, with an uncommonly promising heifer calf of seven months, by her side, presented for exhibition by the president of the society, the

Hon. John Brooks. These animals were the attraction and admiration of all. For neatness of limb, compactness and symmetry of form and proportion, they are hardly to be excelled. These are the first specimens of the race ever seen at our shows. What their milking properties may be is not known, here. The Rural Cyclopædia, an English work of acknowledged authority, contains the remark, that "they pay the feeder better than the breeder, for their cows are very bad milkers, while their oxen and heifers, when in good condition, are exceedingly well adapted to the shambles. They have their beef well developed in the best points, and though a heavy breed, they generally sell at first rate prices, in Smithfield. They seem well adapted, in form and strength, for heavy farm work; but they want sufficient activity, and are now seldom seen in the yoke." And Martin, a British writer of much celebrity, in a treatise on the ox, says of the Hereford, "as milkers they are inferior to the Devons, but acquire an earlier maturity, and fatten both more rapidly and to a greater weight." Whether, with these imputed characteristics on their native soil, they will be any improvement to the stock of New England, remains to be determined by experience. Such accounts of them should, at least, lead to some degree of caution in their very free introduction. Beautiful as they appear, certainly, a committee on milch cows should be slow to recommend them for the dairy.

The president likewise gratuitously presented a noble looking Ayrshire cow from the former stock of that eminent agriculturist, the late Mr. Webster; also a three-fourths blood Ayrshire heifer, four years old, of his own raising. There were other varieties of his stock on exhibition which bore testimony to his success as a skilful breeder.

To the Hon. Stephen Salisbury, one of our trustees, the society are renewedly indebted for the exhibition of his entire family of pure Jersey cattle. His cows have much improved, under his care, in external appearance, since their importation, two years ago. It is greatly to be regretted that this enlightened and devoted friend to agricultural enterprise and improvement was not enabled, through the attention of his tenant, to present to us a particular and extended account of his experience of the product and value of this stock of undoubted blood.

Mr. Paine Aldrich, of Worcester, with most commendable

public spirit, and at much personal inconvenience and trouble, placed in the pens one half-blood Hereford, and three full-blood imported Alderney cows ; together with other individuals of his Jersey stock. The cows were larger and in higher condition than those of Mr. Salisbury. Not being raised within the county, they could not be received in competition for either of the society's premiums. In consideration of the care of Mr. Aldrich in procuring the stock, and his liberality in presenting it for examination, on the occasion, the committee recommend the presentation to him of a set of "Coleman's European Agriculture."

The committee were much struck with the appearance of several animals in the pens, from the herd of that most spirited and intelligent young farmer, Doct. Joseph Burnett, of Southborough. They were fine specimens of Durham, Devon and Alderney breeds, and among them a Devon cow of most remarkable size and beauty. No better looking cattle were at the show. The committee understood that they were here only for exhibition, and their generous proprietor certainly contributed his full share of gratification to those who had an opportunity to inspect them.

Our intelligent, and always active co-worker in the trusts of the society, Harvey Dodge, Esq., of Sutton, had in the pens a beautiful Devon cow, five years old, raised in Vermont. The committee saw with satisfaction other evidences also of his constant regard to the interests and reputation of the society.

The committee cannot doubt, from the appearance and outward points of excellence of the many remarkably promising cows exhibited, that all of the above rewards might have been earned, by a very reasonable amount of care and labor on the part of some of the proprietors. With little attention, the requisitions of the trustees are of easy observance. They are promulgated with all the publicity which can be given to them, in handbills, posters, and otherwise ; and those who would be competitors have the same notice of these prerequisites to a premium, as they have that there is to be a cattle show. Nor can it be complained of, that the society seek as an equivalent for the liberal sums of twenty-five dollars, or fifteen dollars, or twelve or ten, or even any smaller amount from their treasury, that information which is the only purpose of the offer of a pre-

mium. It is of but little account, that an animal is placed upon our grounds on a show day, if we have no statement of her qualities and productiveness. What we want to know, and what we have a right to expect, is, experiments and observations, by which, upon comparison, we may determine which is the best stock for our particular purpose; which breed of cows will yield the most and richest milk, produce the greatest quantity of butter and cheese, give the best stock to the dairy, the yoke or the stall; in a word, be the most profitable to the farmer, in whatever department of husbandry he may be engaged. Without such information, all exhibitions are worthless, and the labor and the money which is lavished upon them had better be applied to the improvement of the land and the cultivation of field and orchard.

In closing this already too extended report, the chairman feels bound still to adhere to, and repeat an opinion formed upon no slight personal observation and experience of his own, and long since expressed, but for which no other member of the committee is responsible, that the greatest improvement which the native stock of our county, and perhaps of the country, has ever received from importations, is in the blood of the short-horn improved Durhams. For the dairy and the shambles especially, as of earliest maturity and most profitable, the preference should be given to this cross. A fusion of the native, and perhaps the Ayrshire with the Devons, and in this county, to the last drop of the blood of old "Denton."

LEVI LINCOLN, *Chairman.*

WORKING OXEN.—The committee found an unusual number of entries in this department—thirty-one in all—and your committee had no small difficulty to contend with in finally awarding the several premiums; as all were of excellent quality, as is usual in Worcester county, some sections of which had in former times the reputation of educating their oxen better than their sons. To-day we only propose speaking of the education of the thirty-one yokes of oxen, as brought forward for our inspection; and the drivers, so far as related to their aptness as teamsters, as well as manly conduct before your committee.

The trial was had within the enclosure of the society's grounds, on carts loaded with 4,000 lbs. each. The drivers

were required to drive their teams within certain bounds marked by stakes, and as near as possible without striking the stakes, and then back up to a given mark; all of which required much patience and skill on the part of the drivers as well as strength and docility on the part of the oxen.

This process was entirely new in our county, and unknown to the competitors until the morning of the show. We are much gratified in being able to state, that not a murmur or a word of dissatisfaction was heard from any competitor with this new and somewhat perplexing mode of trial. In all past trials of this kind the competitor has been required to draw his loaded cart up a hill or inclined plane of about five degrees. The drivers, oxen and spectators seemed well pleased with the change. In the judgment of your committee this mode of trial is preferable. In the first place, it is nearer common practice on the farm; secondly, it is decidedly more merciful, and the maxim should be indelibly stamped on every yoke, "A merciful man is merciful to his beast." One of your committee, at least, believes it would be of more real service to the noble, patient and useful ox, to have it stamped on his horns also. Only in one or two instances in this trial was the undue use of the lash observed. Yet, in several more, there was indubitable evidence of bad, if not cruel, home practice. We refer to the idea which all, or nearly all, our competitors seemed to have acquired on these trials, namely, that the superior art of backing a load was the principle on which their merit was to be decided, when, in fact, equality of match and docility of temper should ever be first regarded.

HARVEY DODGE, *Chairman.*

WORCESTER NORTH.

From the Report of the Committee.

BULLS.—We suppose all will admit that he who rears a valuble bull does much more to improve the stock of his neighborhood, and the whole community, than the farmer who raises a first class heifer, or even five or ten heifers; for good bulls, on an average, even in New England, where stock raising is car-

ried on to a limited extent, as compared with the Middle States and the great West, sire from one to two or three, and some as high as four or five hundred, even, during the period in which they are kept for cows. Whereas, cows, on an average, do not drop more than from four to six calves before they are fattened and slaughtered; so that if a farmer rears a cow and keeps her till she is eight or ten years old, rearing each year her calf, that proves to be very inferior, the community does not suffer a tenth of the injury that is sustained in every case when a worthless bull is kept for cows, in a stock-raising community, for one single year. Yet many farmers will as soon put a cow to a poor, worthless bull, as to a good-blooded and valuable one, even though they design to raise the calf. Your committee are of the opinion that a loss of hundreds of dollars at least, is sustained every year in most towns in this community where this custom is practised.

We are aware that many farmers have an inveterate prejudice against some of the best stock in the country, simply because it is imported or blooded stock, and choose to raise calves sired by bulls that have been raised haphazard, without any reference to size, symmetry of form, blood, or quality of cow from which it came. If the only object is to bring the cow to milk annually and kill the calf for veal at six weeks old, we would rather put a cow to a thorough-bred, short-horned Durham, or Ayrshire bull, and pay a dollar for his use to every cow, than to go for nothing to a thin, lank, coarse animal, that only possesses the power to impress on his get his own ugliness and deformity; for the calf will be worth from one to two dollars more for the shambles when ready to kill.

Many farmers will ridicule the most valuable information and important statistics, if written in a book, and continue to drive their cows to a twenty-five cent bull, because of their suicidal prejudice against imported stock. Forgetting that nearly all our imported bulls were reared by practical, as well as scientific farmers of England, who possess skill in producing neat stock, as far superior to their own egotistical, uncivilized conception of it, as our best stock of Worcester county excels the wild, uncultivated herds that roam the forests of South America.

In England's best farming districts the produce of neat

stock is considered a science as well as a practice, and so perfectly understood is it, that their best farmers can, with almost mathematical certainty, predict what will be the progeny of the cross of any given bloods of sire and dam, in its form, size of bone, general muscular development, tendency to fatten, comparative expense of keeping, disposition, &c.; and yet our old fogies and mushroom farmers will laugh at the most critical observations, and the most extensive experience of the wisest of men, because they happen to be imported.

The best blooded bulls imported from England present to us their beautiful and perfectly symmetrical forms, as the grand result of a system of stock raising by the most scientific breeding, practised by the wisest men, in this vocation, of any now living. We do not hesitate to say that many of the English farmers have a more perfect knowledge of breeding neat stock than any living men, or men that ever have lived. And yet many would-be farmers of our own community sneer at the mere mention of "imported or blooded stock." As well might the little urchin of five years, who builds his tin water wheel under a fall of six inches, of the size of a pipe stem, sneer at the discovery by Fulton, of the application of steam to the navigation of ships; or the young man of twenty, who is just entering a law office, call in question the legal decisions of a Story or a Marshall.

We have many good stock raisers in this county that have made many leagues of progress from the old haphazard mode of raising neat stock, of fifty years ago, but still we are far behind the best stock growers of England. But if our egotism and national pride does not prevent our taking lessons of those that are wiser than ourselves, we may hope eventually, by patient progress, to arrive at as great a degree of perfection in producing cows for the dairy, or beef for market, as the best English farmers.

We would suggest, also, as all neat stock is reared for the dairy and for beef, that it is desirable to obtain both objects in the same animal.

Every man, therefore, who designs to raise a bull, should not only regard the size, shape and blood of his calf, but none should be raised, however promising in these respects, that is

dropped from a cow of ordinary or inferior milking qualities. The bull imparts to the female of his progeny just as much of her butter or cheese making qualities, as the dam that drops it.

JOSHUA T. EVERETT, *Chairman.*

From the Report of the Committee.

COWS AND HEIFERS.—A most important inquiry, at the present time, to the owners of milch cows, is, what breed, or cross of breeds is best adapted to the production of milk, quality, as well as quantity being regarded? It is not the true end and scope of this or any other agricultural society to pick up for premiums one animal from a dairy of some half-dozen, which, fortuitously, may turn out to be a good milker, while the other five, perhaps, are bad or indifferent ones, shrimped, camel-backed, and ugly, of every size and color, without pedigree; selected, or reared without brains or science, upon the doctrine of contingency or luck.

Nor could it have been the object of our Commonwealth in its liberal grants to our various county organizations, so far as such grants are appropriated to the stock growers, that the money should be given to the lucky holder of any chance animal; but to the systematic, intelligent grazier, who aims at excellence and perfection in the stock he produces; and who, like farmer Washington, of blessed memory, carefully registers the breed, keep, characteristics and qualities of his stock, either for the dairy, the plough, or the shambles; who, for instance, when he offers milch cows for premium, has an exact account of the profits of each kind and breed, booked and footed up. Not of those only, annually registered for premiums, but his whole stock, from year to year, so that, by comparison, our citizens may be constantly adding to their stock of knowledge; how to produce the most and best for the least money. It should never be forgotten or lost sight of, that Mammon, himself, reigns in this utilitarian age, holding his throne with an iron grasp; and what "won't pay," as the phrase is, is disreputable. A man now is judged by what he produces or performs, and takes his grade in society, partially at least, by his character and quality.

Recurring again to our first inquiry, as to what breed, or cross of breeds, is most desirable to the intelligent grazier, we confess our want of material. The lack of systematic experience renders it impossible, as yet, to give a satisfactory solution; though many additional facts may be gathered from year to year. In our limited inquiries we find some who still go for the real, true-blue, native American cow, scouting the four-footed, more even than the biped, foreigner. They tell you Alderneys, will end like the hen fever, in real Shanghae disgust. To such we have only to say, go at it with a will, if you can whip imported blood with native, by all means do it; but we tell you, in all frankness, you cannot do it by herding your best cows with a miserable, shrivelled bull, which confessedly impresses himself as much, some say most, upon the young calfling. The best, and only the best, of both sexes, should be selected for propagation. You are contending now with breeds from the mother country, where improvement of blood has been a study, a science, the last two centuries.

When the various imported breeds have been sufficiently tested, whether by a cross with our natives, or *per se*, there can be no question but important and beneficial results must accrue to this branch of husbandry; and our warm acknowledgments are due to those liberal minded men, who, disregarding the expense, have imported the best blooded cows and stock.

Your committee believe that a cross of our best natives with blood cattle has thus far resulted in most important benefits; and while they are constrained to admit that in Worcester north the Ayrshire cross has been most fortunate in obtaining premiums, they still believe, as at present advised, that in the country at large, and especially in New York, the Durham cross has been most successful, not only for the plough and beef-barrel, but also for milk.

* Concord, Sept. 17, 1855.

Dear Sir:—In a conversation with you the other day upon agricultural matters, you asked for my opinion as to what foreign blood I considered best to mingle with our common stock, in order to produce the best milch cows.

I have been a somewhat careful observer of the effects of crossing for many years, and am satisfied, that both in animals and vegetables, when judiciously done, it is productive of the most beneficial results. For, in this way, bad qualities may be obliterated and good ones introduced in their stead.

The Devons, now so symmetrical as to attract the attention of the most indifferent

Before adverting to the premiums, your committee would suggest to those who may enter cows hereafter at future shows, a more systematic and detailed account, of feed given—exact cost thereof, coupled with a succinct detail of time of milking, pasturage, amount of root feed, corn-fodder, shorts, &c., and especially any mode of treatment or feed to cows, believed by them to be peculiar to themselves.

A. CROCKER, *Chairman.*

WORCESTER WEST.

From the Report of the Committee.

DAIRY COWS.—The committee on cows were very much disappointed on going to the pens and not finding a larger number. There were but five, and these were not entered for the society's premiums, but merely for exhibition. Mr. Joshua Sanderson, of Petersham, had two Devons and one native cow, all appearing well. Mr. J. Bruce and Mr. Nathan H. Bacon, of Barre, each had a cow on exhibition that showed good milking qualities, of the Durham and native breeds. The committee were not furnished with any statement from the exhibitors, to show the

observer, were once small, angular, and scarcely desirable in any point of view. The improvement has been equally as great in the Durhams, as well as in sheep and swine. The weight of mutton has more than doubled in the London market within the last hundred years.

I am satisfied that the largest number of fine milch cows is produced by a cross of our common stock with the Durham short-horn blood. They are symmetrical, good feeders, gentle, yield a good flow of milk, and continue it sufficiently late—for I do not, as a general thing, think it desirable that a cow should continue to give milk until the time of calving.

With regard to your other question, whether it may be made profitable for the farmer to raise roots to feed to his milch cows, I am not in the least at a loss for an opinion. I fed eight cows one winter on the best hay and three quarts of meal each per day. The following winter I fed the same cows on hay cut on the same ground, without meal or grain of any kind, but gave each cow per day half a bushel of roots, carrots, beets, turnips and parsnips, and obtained just as many again cans of milk, of equal capacity, as I did when I fed the meal, the cows coming in about the same time as on the previous year.

I should be glad to write more, but have not the leisure at present.

Very truly yours, SIMON BROWN.

A. CROCKER, Esq., Fitchburg.

quantity or quality of the milk each cow gave; they therefore had nothing to judge from except external appearances. It ought not so to be, for we believe the farmers in this society can produce as good cows as can be found in the State, without exception; and for the future we trust they will enter their cows and compete for the society's premiums, as this is one of the most important items in our exhibition. There have been frequent objections to the rules of this society in regard to the requirements of competitors on cows. Those that would enter as competitors, if the rules were less stringent, will not as they now are. It is necessary to have rules and regulations for the management of our society; but can they not be so modified as not to entirely exclude competition in this department of our exhibition? The cow may be considered as standing at the head of our domestic animals; therefore, in justice to her many noble qualities, she ought always to have a fair chance to represent herself at our shows.

It is believed to be a great mistake with most farmers, the keeping of too many cows. In many cases, if they would reduce their number one-fourth, or one-third, they would realize more profit than they do from their present number. There is no animal that pays the farmer better for good feeding and kind treatment than the cow. She always pays down, is no friend to the credit system, and the better you keep her, the better return she makes. It is necessary, in order to have cows do well, to keep them well through the winter, after they have done giving milk, and before calving in the spring, unless you want poor calves, and a small quantity of milk the following season. Some lots of calves will bring ten or twelve dollars apiece in market, and others of the same age will not bring more than six or seven; all, or in a great measure, owing to the difference in keeping the cows; and that difference will go through the remaining income of the season. We cannot be too particular in providing good and convenient stables for them, where they ought always to be kept in the winter, unless it is very mild weather. It is a fault with too many farmers in raising stock that they are not as particular as they ought to be in raising from their best cows; unless the calf happens to come at just such a season of the year, the market man must have it; and perhaps that favorite cow will not have another heifer calf for

five years, or not at all. Now, would it not be well in them to raise their best calves, let them come at any time, if they wish to be improving in their stock?

BENJ. F. HAMILTON, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Report of the Committee.

STOCK IN GENERAL.—The committee regret that they are compelled to admit the decided inferiority of this branch of the society's exhibition. It is true that there were many animals of great excellence upon the ground; but it was obvious at a glance to every observer acquainted with the very superior stock owned in different parts of the old county, that the show of this year was by no means a creditable affair to the farmers of the district. The numbers of animals in the different classes were less than usual, and in some of them the quality was found to be but ordinary, to say the least. It is no part of the duty of the committee to explain the cause of the deficiencies above stated, or to furnish excuses for them, though it might not perhaps be difficult to do it; but they may be permitted to say that, knowing the fact that there is within the society's limits an amount of valuable stock, at this moment, equal, if not superior to what there has ever been before, they are not unwilling to promise for the farmers that the exhibition of next year shall more than restore the character which has been lost by this.

To some parts of the collection of animals brought forward at the present exhibition, the committee are happy to say, none of the foregoing remarks are at all applicable. The important class of working oxen was represented by a large number of very excellent specimens. These were mostly of native breeds, and they were, almost all of them, large, powerful, symmetrical and beautiful animals, well conditioned and well trained.

The fat cattle offered this year were all from Westfield and Hatfield, and more than sustained the reputation of the celebrated feeders in those wealthy towns. Better animals have never before been exhibited here; and we doubt if eight yokes of better cattle could ever have been collected from all the stalls in the Connecticut Valley, and if not from them, certainly not

from those of all the world besides. We must for ourselves declare that we never saw a nobler spectacle of animal life than these sixteen comely, grave and majestic individuals.

Of bulls the number was small, but all fine animals. A three year old, full-blood Hereford, owned by J. B. Lyman, of Huntington, weighing about 1,900, attracted much attention, and deserved it. A yearling bull, seven-eighths Hereford, exhibited by Ahira Lyman, of Northampton, was a large, clean-limbed and beautiful creature, and promises to be very valuable.

Some very handsome steers were on the ground, and may be expected to visit us again in after life; but the young cattle generally, as well as the milch cows, the committee cannot very highly commend. They know that there is better stock of this kind in the county, and hope hereafter to see it. They strongly recommend to all farmers that they give careful attention to what has recently been published relative to some of the foreign breeds of cows, particularly the Ayrshires and Alderneys.

Only a few small lots of sheep were offered. The committee would call attention particularly to the New Oxfordshire breed of sheep, recently introduced into this country, some fine specimens of which were exhibited by Mr. Lawrence Smith, of Middlefield. They are said to be a cross of the Bakewell and Cottswold breeds. Their fleece is not fine, but it is very heavy. The breed promises to be valuable principally for the carcass. They are very large, hardy and handsome, and easily fattened. The committee hope that the value of these sheep will be speedily and thoroughly tested, by some of our most observing farmers, and have strong confidence that the experiment will be successful.

OSMYN BAKER, *Chairman.*

HAMPDEN.

From the Report of the Committee.

BULLS.—The committee having cognizance of animals exhibited in this department submit the following report:—

That, in their opinion, it is a matter of congratulation that, while farming is being reduced to a science, which enables the

farmer to learn the nature of his soils, their adaptation to certain crops, and the quality of manures required for their successful cultivation, we can base our calculations with equal certainty and success in the rearing of cattle, which, at the high and remunerative prices now governing the market, has become an important and leading branch of agricultural industry. It is, therefore, a matter of special interest to the farmer to know how he can realize the greatest profit from this class of stock. All will doubtless agree with the committee, that the best cattle pay best: hence it becomes important to ascertain the surest method of raising cattle which shall all be perfect specimens of their kind. Your committee entertain the opinion, that an ox or a cow can as well be raised to order as that the farmer can have a plow or a cart built to conform to a specific demand, or in accordance with a given pattern. This avowal may, perhaps, startle some; but your committee fully believe its truth can be verified beyond a question, in raising stock from unmixed blood! Who has ever known a good Durham raised from any of our native breeds of cattle? Or who has ever seen an ox or cow, closely resembling our native stock, raised from purely Durham blood? We think none. But in all cases where the peculiar characteristics of the Durham obtain, the animals will be found to possess all the qualities of that valuable breed, and, with suitable care and food, will become beautiful specimens of the Durham, so much admired and so highly prized above all native breeds in our markets, and withal, in such great demand, that large numbers are still imported, at great expense, from foreign shores, and find their way to our western prairies, from whence, ere long, to return liberal supplies for eastern demand.

Your committee would not, however, confine their remarks to the rearing of Durham stock, deeming them equally applicable to the various native breeds. The principle involved is this: that, in raising cattle from unmixed stock, it may be calculated, with great certainty, that the production will be the counterpart of its ancestry. This principle is better understood by those whose experience prompts them to buy and sell blooded stock, at high rates, without even waiting for its expected arrival. This practice largely obtains in our sister States of New Hampshire and Vermont, in the purchase and sale of both cattle

and horses, particularly the latter, colts being often bought and sold, at high prices, months before they are foaled, in cases where the sire is known to be purely Morgan, English, or other valuable blooded stock.

The same principle is strongly illustrated in the human race. How distinctly does a little African blood exhibit itself, when intermingled with that of the white race; or when a little of the latter is mixed with that of the black.

But, without further prolongation of these remarks, your committee return to the consideration of duties specially assigned to them, in the programme of this interesting Annual Fair. In the discharge of these services they have been called to view a large number of bulls and bull calves, but few of which were of unmixed blood; and in accordance with the principle laid down in the foregoing paragraphs of this report, those who have employed sires from this collection, during the past season, can form no certain estimate of the stock, nor even determine the kind which they expect in return. There were on exhibition but two thorough bred bulls of Durham stock; one owned by Alvah Colton, of Longmeadow, and the other by Wilbur Wilson, of Agawam. There were also four full-blooded Devon bulls, three of them owned by H. M. Sessions, of Wilbraham.

CYRUS FRINK, *Chairman.*

HAMPDEN.

From the Report of the Committee on Town Teams.

Only three town teams were exhibited, which contained the requisite number of working oxen to entitle them to premiums, and these were distributed to the following towns:

West Springfield,	1st premium, . . .	$12 00
Longmeadow,	2d " . . .	9 00
Springfield,	3d " . . .	6 00

The committee would not suffer the occasion to pass without some reference to the merits of the animals drawn up for their inspection. All of them were worthy of creditable notice, and

very many of them particularly so. The Westfield team was chiefly composed of fat cattle, and, though precluded by the regulations of the society from awarding it a premium, the committee felt bound in justice to pay it their highest regard. The owners of this team, themselves in all respects model stock growers, evidently possess a peculiar faculty for promoting the physical development of their animals; and the committee would cordially recommend all cattle troubled with leanness to their fostering care; and they would further advise every one who finds it difficult to keep the ribs of his cattle out of sight, to ask these Westfield gentlemen how the thing is done, and he may rely on being well instructed. Should a famine ever threaten this precinct, the committee could desire no better fortune than to enjoy the tender mercies of these benevolent gentlemen, whose fame for catering to the appetites of animals and men is becoming world-wide. Besides the Westfield team there were in the collection four excellent yoke of working oxen from Chicopee, which attracted deserved commendation.

AARON ASHLEY, *Chairman.*

NORFOLK.

From the Report of the Committee on Milch Cows.

The committee have to report, that the whole number entered for premium was twenty-three; the most of which would rank high in the several breeds to which they respectively belong. There were some very fine Jerseys—a greater proportion than at any former exhibition. The show of blood stock of other kinds was good; taken as a whole, it was very creditable. It is to be regretted that greater care is not taken to keep, and render in to the committee, statements of the yield of milk or butter, as required by the rules of the society. Only one *written* statement was presented, that from Dr. Morton, of Needham, which, for precision and minuteness of detail, is entitled to great credit.

The exhibition of milch cows is one of the most interesting features in our annual cattle show; and it is to be hoped that

more pains will be taken in the future to make this department as attractive as it is important. There is the material in Norfolk county to do it; all that is required is the effort.

J. H. Robinson, *Chairman.*

BRISTOL.

From the Report of the Committee.

Bulls.—The show of bulls was not extensive, but of great merit, embracing animals of different breeds, and affording satisfactory evidence of an increased regard for good blood, on the part of our breeders, and a determination to improve the stock of our county, and elevate it to a point of excellence not even aimed at a few years ago.

In no case were the entries for milch cows accompanied by statements such as the rules of the society require; and your committee unanimously recommend that the money appropriated for premiums to cows be divided, according to the following award, among the proprietors of valuable bulls. This course, your committee believe, will answer the double purpose of encouraging the improvement of the bulls of the county, and emphatically calling attention to the rules of the society that have been too often disregarded, alike by committees and exhibitors.

The committee, strictly adhering to the rules, could not, as they desired, award the first premium for Devon bulls to Daniel Wilbur, of Somerset, as he failed to submit any statement of the pedigree of his bull.

No thorough-bred bull of any other breed, "not less than two years old," was exhibited in this class; but your committee recommend gratuities of eight dollars, each, to Benjamin Rodman, of New Bedford, and Joseph S. Fay, Esq., of Woods Hole. The former exhibited his full-blooded Jersey bull, twelve months old, and the latter a full-blooded Jersey bull, three years old. The thanks of the society are due to Mr. Fay, for his politeness in sending to our show several fine animals from his herd, not with the expectation of receiving pecuniary rewards, but influ-

enced by a public-spirited desire to advance the interests of stock-breeders in a county adjoining that in which he himself resides.

Milch Cows.—Though awarding no premiums in this class, your committee desire to notice fine grade cows, belonging to Benjamin R. Almy, Francis Taber, Noah Tripp, William I. Rotch, Benjamin Rodman, Oliver G. Brownell, William H. Topham, Joseph G. Grinnell, Joseph Ricketson 2d, and others, of New Bedford, the beautiful imported Alderney cows of John Wood, of New Bedford, and the fine short-horn belonging to Lorenzo Lincoln, of Taunton.

The committee take pleasure in publishing the yield of Mr. Taber's cow, a fine grade, out of a native and Durham cow by an Ayrshire bull.

She gave as follows:—

From May 11th to June 11th, . . .	1,188 quarts.
During four months, from May 11th, . .	2,252 "
In nine days, from June 3d to 12th, . .	184 "
Largest yield in any one day, . . .	25 "

We regret that we have no information concerning the feed consumed by, or the butter made from this fine cow.

Heifers.—Several young cows having borne calves, and now in milk, were entered as heifers, probably because they were not yet three years old; but all such were excluded from consideration in this class, belonging as they do to the class "Milch cows."

Your committee last year took the liberty of extending its report to a length unprecedented in this society, from a desire to awaken an increased interest in stock breeding among the farmers of Bristol county. They made general observations upon certain animals exhibited upon our show grounds, and endeavored to extend a knowledge of the merits of different breeds of cattle, and to impress upon all breeders a sense of the importance of attention to blood in breeding.

We are gratified by the belief that our efforts were not wholly unavailing. We have reason to know that our report has been

very extensively read in the county; that it was generally approved by stock men, and instructive and useful to many, who for the first time read in its pages of the principles which we desired to inculcate. It is not our intention this year to equal our last report in length; but our desire to increase the breeder's faith in *blood* induces us to say a few words concerning the practical lessons that our recent exhibition was capable of teaching.

The number of animals upon the ground was not so large as in 1854; but we venture to say that in no year has there been more good blood upon any show ground of our society.

One marked feature distinguished this from all previous exhibitions. We allude to the absence of those unsightly monsters known as "native bulls," a genus that has too long been permitted to flourish in Bristol, as well as many other counties.

This absence of mongrels from our pens encourages the belief that the popular faith in the old adage that "a bull is a bull," is already shaken, and is giving way to a modern saw, that "blood is blood." The time will not immediately arrive when these native bulls will be only known as fabulous beings of the past; but we have no fear that they will often hereafter appear upon a Bristol county show ground, to have their ugliness exaggerated by comparison with the beauties of the North Devons, short-horns and Jerseys, that have taken such hold upon the admiration and regard of our farmers.

The opportunity for an examination of the characteristics of different breeds of cattle presented by our annual exhibitions is one of their chief recommendations. Our ears may delight in the rhetoric, our hearts be warmed by the eloquent sentiments that fall from the lips of our orators, merriment and fun may be occasioned by the wit of our after-dinner speakers; but the real, practical lesson is to be learned upon the show ground.

The recent exhibition in New Bedford was eminently successful, as affording to the intelligent farmer an opportunity to study, from living models, some most important principles,—principles that must be attended to, if we would succeed as breeders.

An intelligent farmer placed near Mr. Wilbur's beautiful Devon bull could not fail to observe his fine points. No eye,

accustomed to look at cattle, could help noticing the bright, cheerful, yet mild eye; the deep chest and broad shoulder; the clean limbs of small bone, but strong sinew; the small but compact and beautifully proportioned form of this bull. Near to Mr. Wilbur's, stands "Napoleon," Mr. Day's Devon bull. How they resemble one another in all these points of excellence! The observer could well understand that a committee must ponder well before deciding which is entitled to the first premium. The resemblance of these two thorough-breds, coming from different localities, and of different families, convinces him that they may be considered as types of the breed of North Devons; a belief still strengthened by examining a third Devon, the bull belonging to Mr. Durfee, of Rhode Island. The farmer sees at once that for breeding light, active, docile and tough working oxen, that, when their work is done, will cover well and rapidly, and make fine beef, there is nothing like the Devon. Now, then, let him pass along the line of pens. Coming upon Mr. Shepherd's yearling, he thinks he finds another Devon, so strongly is he marked with the characteristics of that breed, but Mr. Shepherd's bull is only half bred, got by Mr. Day's "Napoleon" out of a native cow. Mr. Page's heifer, and every grade Devon on the ground, all help to teach the important lesson that "blood will tell." That the thorough-bred will mark his offspring, and that the more nearly an animal approaches purity of blood, the more he will resemble the thorough-bred parent, the more certainly he will be marked by the characteristics, and possess the merits of the breed to which he is allied. The study of the short-horned bulls, and the grade short-horns at the recent show, would have conveyed the same lesson, and so it was with the Alderneys or Jerseys.

Now, as we conceive, the practical application of this lesson by the farmer cannot be mistaken. It is plainly this: When a farmer of Bristol county wishes to improve his stock, he must, if a choice is within his reach, make use of the services of a bull of the breed, possessing, in the greatest degree, those characteristics that he desires to impress upon his herd. The purer the blood of that bull, the greater will be the certainty that the calf will resemble the sire. It is fortunate that we possess in our native cows such a hardy and well-acclimated race to serve as mothers, and impart good constitutions to our calves. We

have but to breed to thorough-bred bulls to get valuable grades, a vast improvement upon our native stock. If we discard the inferior animals, and, selecting the best cows, continue to breed up to thorough-breds, never using a grade bull, if it can be avoided, we shall in a few years have grades so high that they will be nearly equal to the original blood, not only in beauty and excellence, but in the invaluable property of stamping their offspring with their own peculiarities.

This principle in breeding is so very important that it cannot be too often repeated to those who are ambitious to improve stock; and this, we trust, will be our excuse for reiterating again and again, that real improvement in our stock will be the result of strict attention to the blood of the breeding stock.

WM. LOGAN RODMAN, *Chairman.*

PLYMOUTH.

Statement of Austin J. Roberts.

FATTENING CATTLE.—Having wished, for some time past, to ascertain with some degree of accuracy the relative value of different kinds of food commonly used to fatten cattle, I have, in accordance with the wishes of the Plymouth County Agricultural Society, selected four head of small-boned, medium-sized cattle, in thrifty condition, for stall feeding. They were weighed and put up for fattening in a tight barn, well ventilated,* on the 4th of September, and fed as follows:—

No. 1. Best quality of hay. As much as it could eat.

No. 2. On potatoes. Commencing with half a bushel, and increasing the quantity to three pecks per day.

No. 3. Indian meal. Beginning with four quarts, and increasing to nine quarts.

No. 4. Oil meal. The same as No. 3.

Nos. 2, 3 and 4 were allowed a sufficiency of hay for digestive purposes.

* Cattle which are confined to the stall thrive faster than those which have the liberty of the yard.

Weight of Animals, Sept. 4.	Weight of Animals, Nov. 2.	Increase.
No. 1, 575 lbs.	No. 1, 642 lbs.	No. 1, 67 lbs.
No. 2, 648 "	No. 2, 717 "	No. 2, 69 "
No. 3, 802 "	No. 3, 934 "	No. 3, 132 "
No. 4, 682 "	No. 4, 825 "	No. 4, 143 "

I adhered to the distinctive kinds of food fed to each animal, although it has been deemed desirable by some to indulge their appetites by a mixture or variety of fodder, as animals often, like man, tire of any constant aliment. In the present instance this did not appear to be the case, as the animals were never overfed, but their food was increased in small quantities and given to them little at a time and often. Punctuality in feeding was strictly observed.

The animal stomach is a very nice measurer of time, and nothing is more important than to keep the animal as quiet and as well satisfied as possible ; and if the time be variable or the usual hour passed over, he becomes hungry and restless, and his condition will suffer, of course. In the selection of food I have been guided by past experience. In the choice of potatoes it has been proved that cattle fed upon them will, in general, have as much tallow as those fed in any other way; and the beef of such cattle is thought by many to have a peculiar juiciness or sweetness. Experiments which have come to my knowledge, of boiling or steaming potatoes for neat stock, have not yet satisfied me that the advantages accruing are an adequate compensation for the labor and expense incurred. The animal No. 2 shows an increase of sixty-nine pounds, which is a little more than a pound a day for the time of fattening, (sixty days.) This is a small increase compared with Nos. 3 and 4, fattened on Indian and oil meal, and increases the expense of fattening on potatoes about two-thirds of a cent more than fattening on Indian meal, as will be seen by the following table :—

			Value of Meat per lb.
No. 1.	Half ton of hay, ...	$6.00	9 cents.
" 2.	40 bush. small potatoes, at 1 shilling,	6.67	$9\frac{2}{3}$ "
" 3.	$11\frac{1}{4}$ bush. of meal, at $1.05, . . .	11.81	9 "
" 4.	$11\frac{1}{4}$ bush. of oil meal, at $1, . . .	11.25	$7\frac{6}{7}$ "

From five years' experience in the use of oil meal I think it is of great value, both for fattening stock and enhancing the value of the manure. The flesh of cattle fattened on it does not possess that oily flavor that some suppose it necessarily would have, but resembles that fattened on Indian corn. In England it is extensively used. Many farmers make use of it merely for the richness and strength it imparts to the excrements of cattle, while, at the same time, it keeps all neat cattle in good heart and entirely free from lice.

HORSES.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Report of the Committee.

The old county of Hampshire has long been noted for its fine horses, and at its annual shows has not fallen far behind the best exhibitions of horses in any part of the State. And why should it not be so, since the county possesses every advantage for the raising of fine stock, and the farmers are beginning to feel the importance of this branch of industry, as was manifested at this year's exhibition? The show of horses on this occasion was very commendable, and in some respects superior, while in others it might fall below that of some previous years. The number of entries was very large, and the number of animals on the ground equal to any other exhibition in the county.

The first class which we notice is that of geldings, or single carriage horses, which was the largest in number of any class on exhibition; and among them were many valuable animals and many fast animals; and this class was the leading feature of the show. Of matched horses the number was not large, but respectable and of fair quality. Also some fine teams of work horses were on the ground, and performed their work with ease, and to the satisfaction of the committee. A large number of colts was presented, of different ages, and many of them of good

blood and of fine appearance. We noticed but two stud horses on the ground: although they possessed some marks of excellence, yet, in the estimation of the examining committee, they did not come up to that high mark which would entitle them to the society's premium. Of breeding mares with colts there was quite a number on exhibition; and in the estimation of the same committee, there was but one of such a character as to be entitled to a premium.

If, then, the view of the said committee be correct, that no animals but the very best are entitled to a premium, and that no person should be encouraged in raising any but the best stock, we would call the attention of farmers to the fact, and recommend that in selecting stock animals, none should be used for that purpose but the very best. Too much care cannot be taken in selecting the best blood, the best constitution, and those, too, possessing the greatest points of excellence. It has been too much the practice to breed from old broken-down mares, which are almost worthless for any other purpose, and much more so for the purpose of breeding; thereby producing an inferior colt, that will hardly pay for raising, and be of little value when raised. While, on the other hand, if care is taken in selecting and breeding from the best animals, of young, healthy, and vigorous constitutions, a noble race of horses may be produced, that will not only pay the expense of raising, but will be a source of profit as well as pleasure to the owners.

Among the different breeds of horses there are none that stand so high in New England as the Morgan and Black Hawk. The excellent qualities of those breeds are so well known and valued in this section of the country, that many horses are offered as Morgan or Black Hawk that have not a particle of those bloods in their veins; but the general appearance and character of those bloods are so well known and understood, that a practised eye will readily detect the deception. The high price which first class horses command, and the ready sale with which they meet, makes the subject of raising good horses worthy the attention of farmers. No part of farming will better pay than the raising of first class horses; while the raising of poor or inferior ones is always a losing business. The true principles of breeding and raising stock of any kind we believe are too little understood and too much neglected. It is a subject that re-

quires care, study and attention, to enable the farmer to pursue this branch of his calling with profit and advantage.

S. Root.

From the Report of the Committee.

Stallions and Breeding Mares.—Your committee would report, that the exhibition in this division of animals was inferior to that of some former years. There were but two entries of stallions; and but one of these had been or was intended to be kept for breeding purposes. Neither of them exhibited any stock as evidence of their fitness for it. Both of them were wanting in many of the essentials of a good horse, and were not such animals as we could recommend to breeders. We therefore did not award a premium to either.

There were six entries of breeding mares. The first premium was awarded to No. 6,—a young, healthy, strong-constitutioned animal, out of a Morgan mare by Kentucky Hunter. She had a splendid specimen of a foal by her side. There was one other mare that had good specimens of stock with her, of the ages of two and four years, but which, in the opinion of your committee, did not come within the intent of the society's offer, and to which we did not award a premium. The remainder of the animals were not such as we considered worthy of a premium, and none was given. Your committee may have erred in declining to award the premiums offered by the society, when a sufficient number of animals was exhibited to receive them. We do not think a premium should be given to an old, broken-down, and faulty animal, because none of the right stamp are presented. We believe that too much pains cannot be taken in the selection of animals for breeders. It is profitless policy to take an animal that, on account of age, disease, or viciousness, is worthless for the road or team, and set it apart as a breeder. "Like generally produces like." And although occasionally a diseased dam may produce young which in early life appears sound and healthy, yet we believe that, in nine cases out of ten, the defects of the parent will ultimately show themselves in the offspring. Let our stock raisers take animals to breed from that are perfectly sound, young or in the prime of life, with unbroken constitutions, and of the right spirit, and they will

find the business much more pleasant and profitable, and deprive the jockey and cheat of much of their employment and gains.

At the present time we want a breed of horses in which are combined beauty, endurance, strength and speed. Not the slow, heavy, draught horse, or the flashy two-forty, but some of the excellencies of both. Give us horses that are perfectly at home at the plough and in the carriage. There is a great demand for such, and the cash is ready; but where are the horses? Let breeders answer the question by producing the supply, and they will find in it large profits, and contribute much to the pleasure and comfort of the community.

LEVI STOCKBRIDGE, *Chairman.*

HAMPDEN.

From the Report of the Committee.

FARM HORSES.—The committee intrusted with the examination of farm horses report only three pairs as competitors for premiums. These teams were successively attached to a wagon loaded with iron, and driven in the most difficult places, performing their allotted task with great freedom and seeming delight. In order to test more fully the capacity and willingness of these noble animals, as well as the skill of the several drivers, one of the wheels of the wagon was chained to prevent its turning, yet the mild but expressive signal to "go," when given by the driver, was quickly responded to by the sensitive and faithful animals, and the load, with all its impediments, was carried ahead to the satisfaction of all interested in the contest. The task in each instance was so well and equally executed by the several teams, that the committee found it no easy matter to decide upon their relative merits, and had it been in their power, they would gladly have accorded a first premium to each competitor; but their wishes in this respect were barred, by being reminded that, since in a race all run, one only could win the prize.

HOMER ELY, *Chairman.*

From the Report of the Committee on Carriage Horses.

The committee, in submitting their report, feel that they would come far short of discharging their whole duty by merely awarding the premiums offered by the society, without making some suggestions which occur to them in relation to this part of the exhibition, and the importance and necessity of improving the breed of horses in this county.

Although the exhibition of horses at this show was quite creditable to the county, and though many fine animals were present for examination, many of them with decided marks of excellence, yet they were not all of that high character which this county ought and has a right to expect. Hampden, from its soil and climate, and the intelligence and enterprise of its inhabitants, is capable of producing as fine horses as any part of New England; and the committee are gratified to know that the farmers of the county are giving increased attention to the subject, and are introducing valuable stock horses of good blood and excellent quality.

Among the good blood horses of New England, the Morgan and Black Hawk stand the highest, and many of them possess marked superiority. The peculiar character and traits of these bloods are well known and understood by many of our enterprising stock growers, and will be readily detected by any practical eye. Indeed, the character of those horses stands so high, that many specimens offered for exhibition and premium are entered as Morgan or Black Hawk, and yet have not a particle of those bloods in their veins.

Another topic to which the committee would invite attention is the character and condition of blood mares. It has formerly been too much the practice to breed from mares which have been broken down and worn out, by hard work or bad management, and consequently of little or no value for other purposes, and still less as breeders. Such animals produce only a puny race, with unsound constitutions, liable to infirmities and disease, too valueless to pay for even half the trouble and expense of rearing. But a very different practice is beginning to be adopted. Many farmers are now taking the right course, by selecting the very best young mares for breeding, as soon as

they arrive at mature age, giving them proper care and attention, and requiring of them no more work than they can perform without injury and pay their keeping, rearing at the same time a valuable colt, which proves a source of great pleasure and profit to the owner, besides adding one more noble animal to his farm stock. When this course obtains among all farmers who make a practice of raising this class of stock, we shall not be under the necessity of going abroad for our best horses, but shall be able to furnish other portions of the country with as good animals as any part of the world can produce.

JUSTIN ELY, *Chairman.*

SWINE.

ESSEX.

Statement of George Coffin.

I herewith submit the following statement of my breeding sow, which I now enter for premium, accompanied by her pigs. The sow is a cross of the Suffolk, Mackay and Byfield. She was two years old the 15th of last April.

She has had forty-three pigs; seven when she was seven months old; ten when she was twelve months old; nine when seventeen months old. These last were on exhibition at Lawrence, last year. On the 25th of last March she had eight pigs, which I sold, when six weeks old, for $30.50. The pigs now with the sow are five weeks old, nine in number.

In the summer, when she does not suckle, I feed her principally on grass and weeds; in the winter on apples and pumpkins. When suckling, I give her shorts and Indian meal, about equal parts, stirred up with water.

HAVERHILL, September 26, 1855.

WORCESTER NORTH.

From the Report of the Committee.

Perhaps no animal better illustrates the "law of progress," in the success which has attended the efforts of man to improve and develop him, than the hog. Whatever might have been the degree of perfection which he possessed as an article of food, in that early period when he first became a denizen of this globe, long before there was a man to test his edible qualities, in our estimate of what education and training have done for him, we must take him as he existed, a wild barbarian in the forests of the old world; a creature of great size and prodigious strength; of long limbs and great fleetness; competing with the horse in speed, and defending himself successfully, even against the attacks of the lion. But his flesh we must presume to be of a very inferior quality, although the head of the wild boar was esteemed a famous dish at the tables of the barons. From this condition man has reclaimed him, and, by good feeding, gentle training, and a judicious system of breeding, has succeeded in bringing him up to the high standard of perfection to which he has attained in our day.

But, notwithstanding the hog is a creature of such excellent physical attainments, and has also in our day established for himself, by numerous examples, a character for intelligence and aptitude in learning, inasmuch as he has succeeded in mastering his alphabet, in playing cards, and outrivalling even the dog in searching for game, and in performing the other evolutions, as to back and stand, equal to the most accomplished pointer, besides many other sagacious feats. And, although the revelations of history and science introduce him to us as a descendant of most ancient ancestry, living contemporaneously with the extinct Mastodons and Elephants, and belonging by classification to the intelligent group of animals called the Pachydermata, he has, nevertheless, from time immemorial, been the object of a most unjust and inveterate prejudice. The Egyptians and the Jews fulminated against him their legal thunder, branded him as unclean, and pronounced his flesh unfit to be eaten. The Mohammedans, following in the wake of the same

peculiar sentiments, thundered forth their anathemas against pork.

But, while the ancient defamers of the hog's good name have been stripped of their glory and power; while Egypt has been reduced to a mere graveyard of her ancient renown, and the ruins of her former glory have become her national tombstones; while the Jews have been scattered and peeled, and become the subjects of an inveterate prejudice, such as their fathers fastened upon the unoffending swine; while clouds and darkness have settled around the home of the Mussulman; the hog has perseveringly rooted on, in the line of his humble vocation, and Providence, as a reward for the patient fidelity with which he pursues his daily round of duties, has gradually been rooting from the hearts of men the prejudice that has so long existed against him. He has—unlike his ancient defamers—steadily pursued the highway of progress; kept pace with the advance of civilization, and has gradually developed his physical attributes, until he has become the most important of all the domestic animals, a favorite with the most enlightened nations of the earth.

In this he strikingly illustrates the truth, which is sometimes brought to our notice in other departments of the divine economy, that modest merit, though obscure in its position, and called to struggle against the withering breath of slander and the thick foggy vapors of a "fogie" conservatism, is nevertheless destined, "by patient continuance in well doing," to overcome all adverse circumstances, and, emerging into the light of a better day, cause its own worth to be acknowledged and appreciated.

The life of the hog, though not allowed to be strictly a poetic one, is not entirely devoid of some points of interest, and, but for our ancient prejudices, might furnish analogies and types for the pen of the poet, the theologian and the philosopher. Studied with this view, he might be found to produce metaphorical illustrations of the popular law of progress, the abstruse doctrine of discreet degrees, and the modern dogma of manifest destiny, besides furnishing a glowing type of that passive character that is sometimes met with at the present day.

The hog confines himself—with the proper humility of one who knows his place—to the exact *sphere* that nature has

marked out for him, and filling up rapidly the full measure of his pighood, he pursues with fidelity the one single object of his existence, viz: to eat, get fat, and be eaten in return. Living a life marked with the virtues of contentment and gratitude, he at last passes to the high and noble destiny of entering into that close and intimate relationship to humanity of which, by the subtle alchemy of assimilation, he is made to become a part and parcel of man's very structure; in short, of passing from the condition of a *hog* to that of a *man*.

E. F. BAILEY, *Chairman*.

HAMPSHIRE.

Report of the Committee.

We invite attention to a few practical hints, and perhaps to some existing errors, with regard to breeding, selecting, feeding, and general management of the boar.

A choice breed should be selected, preserved and improved. It is more honorable to breed a choice boar, than to import him. Breeding a boar for service is a matter of no small importance, and success requires skill and good judgment. The pedigree, for at least three generations back, should be ascertained, in order to avoid any impurities of blood, which frequently make their appearance after generations of apparently pure stock.

In breeding it would be well to observe at what age a sow brings the best pigs, and whether at the first or second litter; also the effect of in and in breeding; and whether the boar that first serves the sow has any influence on succeeding litters; and whether stock from two different boars is of equal quality, if the one serves ten sows a week, and the other only as many in a year.

In selecting the boar for service no haste is required. It is too frequently done when the pigs are quite young. If all of them should run together, and have the same keeping until they are somewhat matured, a good judge of stock will make a good selection.

The feed of the boar should be such as to produce a rapid

growth and bring him early to maturity, without laying on too much flesh. Among the various kinds of food in common use, the best for growing swine are milk, boiled potatoes, wheat and rye bran, with a mixture of green clover and weeds; while Indian meal and all other heavy grains should be cautiously fed.

With regard to the management of boars, they are too generally brought into service, while too young; and are fattened and killed when they should be in their prime. And they are not always supplied with litter, sufficient to keep them clean and healthy, especially in cold, damp weather.

LEVI P. WARNER, *Chairman.*

Experiment by Albert Montague.

FEEDING SWINE.—I present an experiment in feeding swine with cooked and with uncooked food.

The meal, cooked and uncooked, was alike; one-half corn, one-fourth oats, and one-fourth broom-seed. I cooked the meal by stirring it into boiling water, and letting it boil from thirty to forty minutes, by which time it would swell to three times its capacity before boiling. The pigs selected were all doing well upon uncooked food. I put four in two pens, side by side; weighed them four different times; kept an exact account of their weight at each weighing, and weighed them about the same hour of the day each time. I fed two of them with cooked meal four weeks, and they were not so heavy by eleven pounds as at the time I commenced. They were weighed twice during the time. They ate four bushels of meal. I fed eight and one-fourth bushels of meal, uncooked, to the others, and they gained eighty-two pounds. I then fed the last named pigs three and one-half bushels of cooked meal, and in three weeks they lost four pounds. I fed five and a half bushels of raw meal to those first fed on cooked food, and in three weeks they gained sixty-one pounds. I think this proves conclusively that we cannot fatten swine, with profit, on cooked food. Had my pigs never had any meal but what had been cooked, I presume they might have improved a little upon it; but taking them from uncooked and putting them upon cooked food, they did not eat quite so freely at first as they otherwise might—hence a loss.

But when we remember that even a hog cannot be so *hoggish* as to more than fill himself, and one quart of cooked meal would fill them as much as three quarts of uncooked meal, we can easily see that a pig, fed on uncooked meal, would eat nearly or quite three times the value of meal, compared with the one fed on cooked food, providing cooking did not increase the value. Even if cooking increases the value one-third, then a pig would not be able to eat enough to fatten readily, as it must take a certain amount of food to support life, whether cooked or uncooked. Taking swine from uncooked food and putting them upon cooked food, in both cases, they lost in weight. On the other hand, taking them from cooked food and giving them uncooked food, there was a fair gain.

SUNDERLAND, Oct. 8, 1855.

HAMPDEN.

Report of the Committee.

The committee on swine, availing themselves of the privilege usually granted to all committees on important subjects, to embrace such collateral testimony as may be elicited by an examination of the subject referred, and to illustrate their conclusions by comparisons analogous to the direct object of their investigation, have attended to the duties of their appointment, and respectfully submit their report in the form of A TALE ON SWINE.

"My kingdom for a horse," that we might escape the duty. A Tale on Swine! Who ever saw a swine without a tail? or, who ever saw a swine with two tails? Now, let us not be misunderstood in this subject, for the law makes nice distinctions sometimes in matters of less importance; and as, by recent enactment, the construction of the law is intrusted to the jury, the committee, as jurors in this case, will first decide the distinction between a *tail* and a *tale*. If we remove the "t" from tail, it becomes a malady; if from tale, it leaves a proscribed beverage under the present license law, and this would seem to exhibit the distinction to a t. But still greater distinctions do exist between the two, which will be apparent by a further illus-

tration. A *tail* is a positive, natural, and hereditary appendage to the quadruped race, and every animal is entitled to the comforts and benefits derived from the use of one. A *tale* is only a negative, artificial and modern appendage, and is found in use more generally in the higher circles of fashionable *bipeds;* and hence it is that we observe so many of our most genteel and even fastidious species, hurrying to the celebrated watering places with their tales in hand, and reading their history while riding in the cars. But, as it is claimed that every well modelled and discreetly managed *tale* has a *moral*, your committee cannot offer a single objection to their use, but would rather desire that every man, woman and child in the community should have a tale of their own, and watch with eager solicitude the development of its moral. But in constructing one for the special use of the members of this society, your committee feel great diffidence, for they would not be considered as tale bearers; and since long tales on swine are even considered superfluous, they will present the important matter in two parts.

Considering it an imposed duty to discriminate and distinctly examine the several classes of animals which come under their inspection, the committee ask a moment's indulgence in pointing out the line of demarcation between two classes of animals somewhat homogeneous in their nature and habits, yet possessing such dissimilar traits of character as to justify a comparative view of both. We speak of the boar proper, and the proper bore:—the latter a distinct breed, although not recognized in any modern herd-book, probably from the fact that its representatives have no character worth the record. But it is a fixed fact, that under all circumstances, a proper bore completes the record of his class. There are not a few of this species that assume a large share of political importance, about the time of our annual elections, and such occasions are to them what our annual cattle shows are to the race of boars, viz.: an hour of competition for the premiums. The highest premium ever awarded to the class of bores was disposed of at the last presidential election. The true, original boar never meddles with politics, and this is a distinctive point in his character.

The two races afford an instructive study. Examine their ambrotypes—a modern improvement in presenting correct pictures—and we shall observe more clearly their relation, and the

struggle between nature and art. In such a comparison we shall discover that both have regular features, and that both wear bristles, the one wearing his on his back, the other on his upper lip; the one never smokes, while the other is seldom seen without a roll of the burning weed between his teeth; the one has a ring in his nose to prevent his grubbing, and the other should have one to aid him in the same process; the one is confined to his sty, and the good of the community demands that the other should be similarly secured. But with all these discrepancies in their condition, we find them approximating the grand climax of union by the most tender demonstration of feeling and taste. Yes, let the bore freely satisfy the ardent desires of his inner man with the more delicate parts of the boar, and what is he then but a mere stuffed sausage! Now, the union is consummated, and both natures are blended, producing thereby a perfect example of—fusion.

In introducing the second part of our tale, your committee would first premise that every suitable preparation had been made by the directors for the accommodation of all invited guests, whether from the city, the suburban villages, or the more remote towns. Tenements were indeed provided for all, yet only two of them were occupied, whether from the muddy state of the roads, or the more probable desire to follow city fashions, and ride in carriages as do city bores, was a question your committee did not pause to solve. But such was the fact, and they were so received and respectfully waited upon as they were handed from their family carryalls. Cards of introduction were duly furnished, through which the committee were duly made acquainted with the genealogy and distinctive merits of each respective family. Many of these appeared anxious to exhibit their claim to affinity with the royal blood of Suffolk; while others were equally gratified in tracing their relation, by direct descent, to the noble house of Essex. Thus we see that aristocracy is the same domineering principle, whether found in the pig pen, or in the parlor.

It was not the duty nor the pleasure of your committee to inquire as to their purity of blood, but to judge of their qualifications for the higher purpose of their existence, viz.: their usefulness after death, or, in other words, the quantity and quality of pork and lard they would yield in proportion to the

food consumed. With these views, the examination commenced with the boars, of which there were seven present, and all of the right character to leave behind them an impress of their good qualities. References in regard to this fact were the living witnesses around them, whose future history will afford interesting research for coming historians who may grace the successive generations of pigdom.

Of breeding sows there were eleven, ten of which were attended with their families, consisting of seventy-nine members of different ages, but all requiring the tender solicitude of maternal care and nursing—what a sight! Seventy-nine as clean, plump, hearty looking little fellows as could be found in any school district! And this is no invidious comparison, for by way of distinction, the committee were introduced to one family as of the seminary stock. Of this family much might be said, if liberty of speech were always admissible; but it is enough for present remark, that they were *multum in parvo*. Just look at them, as one after another approaches the mother, who gently reclines upon the straw, giving to each a note of affectionate recognition. Hear them recite their lessons in the dead languages, and modestly retire to their respective places at the breast. If it be true that "'tis education forms the common mind," we may expect fat things from this "happy family" at some future day.

There was another from whom a biographical note was received, which read substantially as follows: "I am now three and a half years of age. In April, when only eleven months old, was the mother of twelve piglets; in the following September, I had nine more; and in the next March, I added twelve more to my family; then again, in a subsequent September, I nursed ten more; again, in March, I gave birth to eleven, and at the present time, I am the happy mother of ten, which are here present to add to the attractive features of this pleasant occasion, although infants of only three weeks." This statement was duly certified by his owner, and the aggregate value of this family was estimated at one hundred and sixty dollars, over the signature of Michael Dorne, of West Springfield.

There were others present, too, whose family record would furnish many interesting facts for those more inquisitive than wise in relation to their antecedents; but our limits will only

permit us to group them as a family circle, in regard to which it may be truly said, that Hampden has never exhibited clearer evidences of improvement in this department of her exhibitions, than was our lot to record on the present occasion. Many mothers of a higher order of creation might here have learned from observation, the important fact, that cleanliness and maternal discipline add greatly to the appearance and good behavior of their offspring; and even Barnum might have been flattered with such a "Baby-Show."

There remains still to be noticed a distinct family, holding an intermediate relation to those around them, and which, under different circumstances, would not improperly be considered sophomores—something between the freshmen and the seniors. These were offered as weaned pigs, and their age stated at five months. They were evidently of that Victoria stock, whose reputation has become a "fixed fact," as the society's premium list for the last ten years will testify, thereby precluding the necessity of further comment upon their history or peculiarities.

And now, having fulfilled our duties, we respectfully drop our tale and deduce our moral, to wit: that, as the executive of the society has been selected to present the tale, it may be a legitimate hint to every member to use all proper effort to enable himself, at the close of the year, to make both ends meet.

FRANCIS BREWER, *Chairman.*

POULTRY.

ESSEX.

From the Report of the Committee.

The appointment of a "committee on poultry," with authority to award the sum of $40 in undefined gratuities, was probably never dreamed of by the venerated founders of this society. This department of modern agricultural shows was neither alluded to in the annual address or proceedings for a good number of years, and the yeomen of Essex, in those days, undoubtedly endorsed the opinion of the Rev. Dr. Deane, in his "New

England Farmer." "Poultry," said this practical writer, "may be considered as part of a husbandman's stock. But the keeping of great numbers of dunghill fowls will not turn to his advantage; as it is certain they will never indemnify him for the corn and grain that are requisite for their support. Yet on a farm a few of them may be useful, to pick up what would otherwise be lost. And in this view they seem to be profitable only a part of the year. If confined, they will not prosper, though they have a yard of some extent; if not confined, they will be mischievous to the garden and field." This is, perhaps, true enough now.

But agriculture, like every thing else under the sway of humanity, is subject to a change of fashions, or rather notions. When the Massachusetts Society for the Promotion of Agriculture was in the useful vigor of its youth, (as we are informed by that Nestor of Massachusetts farmers, the Hon. Josiah Quincy,) "the great criterion of a good farmer was the making of good cider, and the process of making cider was one of the most studied and elaborate of all subjects of the farmer's attention; and in point of complexity, length and minuteness of care and preparation, was but little inferior to the making of glass, porcelain, or Java china." Where are the cider presses now?

Other matters were in turn made hobbies of by those self-styled friends of agriculture, who are ever caracolling around the agricultural arena, blowing loudly on their own trumpets, and often filling their pockets at the expense of those credulous mortals who seek to avoid labor by finding the philosopher's stone of rural profit. Merino sheep, China tree corn, Rohan potatoes, Gama grass, and Morus Multicaulis, were each in turn loudly extolled as speedy stepping-stones to agricultural wealth. The "hen fever" followed then—what is to follow it?

Raising fancy poultry is no new whim. Peacocks were so esteemed by king Solomon that he had them brought him regularly in his Tarshish fleet; and we read in several old Roman works of their pigeon houses and geese ponds, their ducks and fatted capons. Queen Bess was famed for her well-stocked poultry yard; and there is no account of a henery equal in extent and magnificence to one erected fifty years ago by Lord Penryhn, at his seat near Wilmington, Cheshire county, England. But it was not until 1848 that the public were informed

what a great source of profit and satisfaction they could find in poultry. It was shown that hecatombs of fowls of every description, and quintillions of eggs, were annually consumed in every State; yet the supply was not equal to the demand, and the profits of the raisers were from thirty to one hundred per cent. upon the capital invested. Societies were at once formed, on the genuine mutual admiration principle, for the encouragement of poultry fanciers; exhibitions of fowls were held, to which the most distinguished statesmen contributed, and which thousands visited; periodicals were established for the sole purpose of aiding cunning venders to dispose of their monstrosities, and we doubt if the archives of humbuggery has a chapter equal to the "History of the Hen Fever," as chronicled by one of its arch promoters.

This *fowl* play is now over,—we learn that the demand for giraffe cocks and chaise-top hens is slight,—the hoarse croak of the ill-favored Shanghae is seldom heard in the land; and many a deluded victim sighs when he comes across large bills for Botherempootrums, Phlapdhudles, or Chittacochas. Political parties may logically prove that they are not dead, but the "hen fever" was fatal; nay, it is hard to secure a respectable attendance at the "wake." A portion of our fellow laborers refused to come up to the *scratch*. Perhaps they feared that this committee, like the invaders of Rome, might be troubled by a *Hiss* from the valiant geese, or that the *quack* of the ducks might interfere with our regular practice. But those who did respond to the clarion-calls of the "cock that crowed in the morn," were *in full feather*, and *on the wing*, until the most wide-awake pigeon had gone to roost, endeavoring to judge impartially, and to emulate the peacock in displaying a tale.

The committee found a long array of well-filled coops, containing a goodly number of domestic and fancy poultry. Yet there was only one flock of turkeys, (although a second lot was exhibited on another portion of the field the next day,) and but one lot of geese, called "Bremen," but much smaller than the many fine specimens of the same race, descendants of those imported by Judge Sisson, some thirty years ago, which are to be seen in various parts of the county. A flock of ducks, of a cross between the wild and tame races, showed the utility of domesticating our native fowl. The show of pigeons was ex-

cellent, and from what the committee could gather, those birds can be reared, by every one who cultivates land, with great profit. They are easily managed, cheaply fed, very prolific, and find a ready sale, if not needed at home. The sweepings of all poultry houses, properly composted, is nearly as fertilizing as any imported guano—and the Egyptians obtain all their manure from their pigeon houses. Ammonia, uric acid and albumen are found in the droppings of every description of poultry.

Domesticated rabbits were exhibited in great variety. In several European countries, and in the vicinity of New York city, these animals are cultivated in large numbers, their amazing fecundity rendering a "warren" very profitable. Those who have kept them in this county say that any one, who will manage them properly, can obtain from one buck and four does, fed at an average expense of four cents a day, two plump young rabbits, fit for the table, each week. Your committee, however, did not award small gratuities for the best rabbits, or for a curious white woodchuck exhibited, because they were convinced of their actual utility. Such a test would exclude most of the fancy articles from the attractive exhibition of ladies' work, and it would hardly do to apply it to the fancy horses, the ornamental carriages, the costly fruits, or the rare flowers. The committee saw interested crowds watching the specimens of the animals of our county, and thought that small gratuities should reward the bright-eyed lads who exhibited them.

There is, unfortunately, little exertion made to interest the farmer's boy. He is forced to "do the chores," or to labor with worn-out tools, and he never has an opportunity to earn distinction or pocket money. Easy communication with the cities and manufacturing towns presents to his mind the apple of discord as well as of temptation. The clerk and the apprentice, better dressed, tell him of their library associations, their debating societies, and their opportunity to make money by overwork or perquisites. Is it strange that so many country-born boys run away from the old homesteads, or persuade their parents to find them situations in the city?

It is different in England. Nor is her agricultural glory attributable to her scientific farmers, to her physiological herdsmen, or to her practical chemists. Her sons are retained in

their ancestral homesteads, where they have dove-cotes, and rabbit-warrens, and poultry-yards and gardens. Trained as choristers, they chant in the village church, and are encouraged to engage in out-of-door amusements, those precious links of domestic life. In those cottage homes grow English vigor, like English oak, to branch far and wide, yet have a sound heart. Young men are contented at home—they till the soil their fathers tilled, and endeavor to transmit it in their turn to their first born sons, in better condition than it was when they received it. Crowded out by a surplus population, a younger son may engage in commerce, or follow the fortunes of the red-cross flag, but he ever hopes that the day will come when fortune will permit him to become a British landholder. He wishes to improve his native soil, in which his early affections were deeply planted, and he is ever ready to exclaim,—

> "Where'er I roam, whatever climes I see,
> My heart, untravelled, still returns to thee."

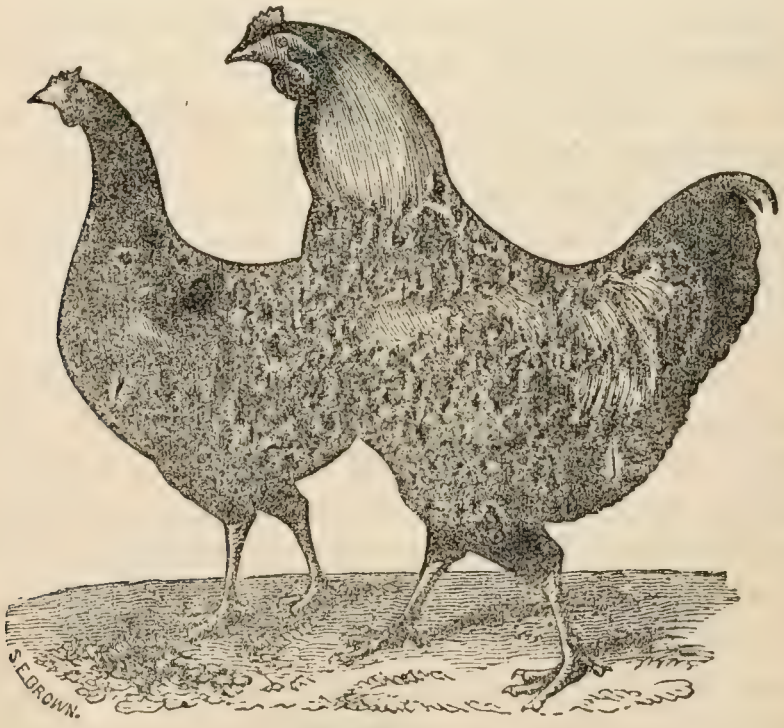
Your committee would respectfully suggest the propriety of awarding premiums to lads, for poultry, gardens, vegetables and animals, equal in amount to the sum distributed among the girls for their ornamental handiwork. It matters not what they may bring, if it add to the interest of the exhibition, and plants in their youthful breasts a desire to become exhibitors. When these boys become farmers in their turn, rest assured that the one who was the fortunate competitor for a rabbit or chicken premium, will win higher honors. "Just as the twig is bent the tree 's inclined."

Harrison Eaton, of Haverhill, was the only exhibitor who complied with the desire of the society to have statements furnished. He exhibited four hens, a part of a flock kept since January last, and averaging sixteen—two of them cocks. They were fed on corn, (with oyster shells always by them,) and consumed twelve bushels, costing $14.13. They had laid 1790 eggs, which had been sold at an average price of twenty-one cents per dozen. The hens were of the old-fashioned "creeper" breed.

In concluding this somewhat discursive report, your committee would hope that censure may be averted from their successors by a classification and definition of the gratuities to be

awarded. They would further recommend that written statements be required in every instance, and that a preference be given to fowls raised in the county. True agricultural science (no matter to what subject it may be applied,) is, after all, but inferences drawn from well-ascertained truths—mere theories are of no value, except as their application elicits profitable results. Demosthenes, when asked the first requisite of eloquence, replied, "action,"—when asked the second, he replied, "action,"—and the third, he still replied, "action." So the exhibitor of poultry should remember that "facts, *facts*, FACTS" are what the farmer wishes, ere he will keep over a dozen or two of fowl. Let him give such information as will show the cost of keeping a flock of fowls "well-favored and fat-fleshed" —and if after giving corn for months to another variety "very ill-favored and lean-fleshed" they are as "ill-favored" as before, let it be known. If these statements show that with judicious management certain breeds can be made a source of profit, if raised by the farmer in large flocks, inquiry will be stimulated, emulation excited, improvement will follow as a matter of course, and future chicken committees will have something to *crow over*.

BEN: PERLEY POORE, *Chairman*.



Black Shanghae.

WORCESTER NORTH.

From the Report of the Committee.

The demand for poultry and eggs in our market is constantly and rapidly increasing, so that, at all seasons, those articles command, here, a ready sale and good prices.

In order to insure success with fowls, care should be exercised in the selection of varieties, as it costs but little more, if any, to keep a variety which grows fast, fats quick, and affords the most tender, sweet and delicious flesh, than another which is its opposite in all these respects, or a variety which affords a constant and abundant supply of eggs of the first quality, than another which lays but rarely, and eggs of an inferior quality at that. Your committee recommend a selection of our best native fowls, crossed slightly with those imported varieties which afford the best flesh, if intended for the table, or with such as are noted for constant laying, if to obtain eggs be the object, as with the Bolton Grays. We also recommend the game fowl crossed with some larger variety.

Shelter should be afforded, which should be cool in summer, warm in winter, dry at all seasons, well ventilated, and carefully protected from exposure to the winds.

Care should also be exercised in the matter of food, which should afford variety, and particularly in winter should contain some portion of animal matter. For the principal article, we recommend Indian corn, or dough made of Indian meal, of the yellow varieties only.

One other item, of which your committee feel constrained to speak, in this connection, is the droppings of fowls, which, if saved with care, afford a most valuable fertilizer, and if taken properly into the account, add materially to the profits of the business. Call the article thus saved dirty, if you please, it is of such a character, that, though it be the veriest filth, yet if properly prepared and sprinkled over your fields, through your orchards, in your graperies, nature purifies, transforms, and after a season, returns it to you in the golden sheaves of life-sustaining grain, the fragrant fruitage, and the purple clusters of the vine.

Your committee, from observation, as well as from several

experiments actually tried by themselves, are unanimous in the opinion that the article in question is fully equal in value, pound for pound, to the best Peruvian guano. We grant it may not be quite so rich in ammonia as that made from birds fed mostly on fish, but believe it possesses other qualities in a greater degree, which render it more durable in the soil, and less liable to injure seeds and plants by burning, &c., and which, therefore, fully offset the deficiency in ammonia.

Your committee have waited long for written statements from some of our members who have been experimenting with fowls the present season, but have thus far received only one, and even that one we are not permitted to enter entire. We therefore quote from it, and also from some verbal statements made to us.

A prominent member of our society has kept, from January 1st to July 1st, 100 fowls, 10 roosters, and an average number of 90 laying hens. He has obtained in that time 408 dozen of eggs, worth 20 cents per dozen, or $81.60. He estimates the value of manure saved, $10; dropped in the field, $8—total, $99.60. The sole feed has been yellow corn, 46 bushels, costing $52.90.

In August the lot was sold at about 14 cents per pound, and a new lot bought for about half what the old brought. He estimates the expense of keeping from July to January at $30, value of eggs, $25, of manure saved and dropped, $14; thus the cost of keeping for the year is, in corn, $82.90, the product in eggs, $106.60, in manure, $32; total, $138.60—profit, $55.70. He estimates the difference between the amount realized for the old lot and the cost of the new, together with the benefit to his orchard by their destroying bugs, &c., to equal the rent of the poultry house and the care of the fowls. He gives his fowls a large range in a young orchard. It will be seen that the latter part of the estimate must be guess-work, "judging of the future by the past."

Another member stated that he "keeps eight hens, black Spanish, which afford more profit, in proportion to the expense, than any thing else on his farm, as they produce usually about four dozen eggs per week, and get their own living through the summer season."

Another, living in the village, keeps two hens, a cross be-

tween the Bolton gray and the common varieties, which have actually laid one dozen eggs per week for several successive weeks.

W. G. WYMAN, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

From the Report of the Committee.

Poultry and eggs are to such a degree articles of necessity in household economy, that the production of them should hold no inferior place in the consideration of the public. In health and in sickness—to gratify the demands of robust life, or to tempt the reluctant appetite of returning health,—the fruits of the poultry yard are all important.

Articles of such prime necessity, therefore, should receive as much care and attention as is bestowed upon the rearing of stock. It is believed that less is generally known respecting the best methods of raising fowls than of any other animals grown upon the farm. This ought not so to be. As much should be known in regard to the best breeds of fowls, whether for their flesh or for their eggs, as is known respecting the best breeds of horses or cattle. Accurate information should also be disseminated in reference to the best mode of keeping fowls, to insure the largest return for the outlay of time and money. Very few farmers raise fowls to gratify the fancy; they raise them for their flesh and their eggs, and they desire those breeds of fowls, and that method of keeping which will best accomplish the result thus aimed at with the least expense. Fancy fowl growing is not to be condemned, for it affords a healthy pastime, and is not so expensive as some other sources of amusement. It is particularly a delightful occupation for children, and they should be encouraged in it. It may not be amiss, however, to hint, in this connection, that this description of poultry breeders should not allow their animals to trespass on their neighbors' gardens, especially in seed time. But farmers have an object in raising poultry beyond mere amusement. They look, as they should, to profit. They care little about the names of the various descriptions of fowls, if they can pronounce them, and not much respecting their plumage. But they want that variety, or those varieties, which will tell most favorably upon the table and in the pocket.

In view of the importance of this subject, would it not be well for agricultural societies to offer liberal premiums for essays upon the nature and habits of fowls, and the best breeds, includ-

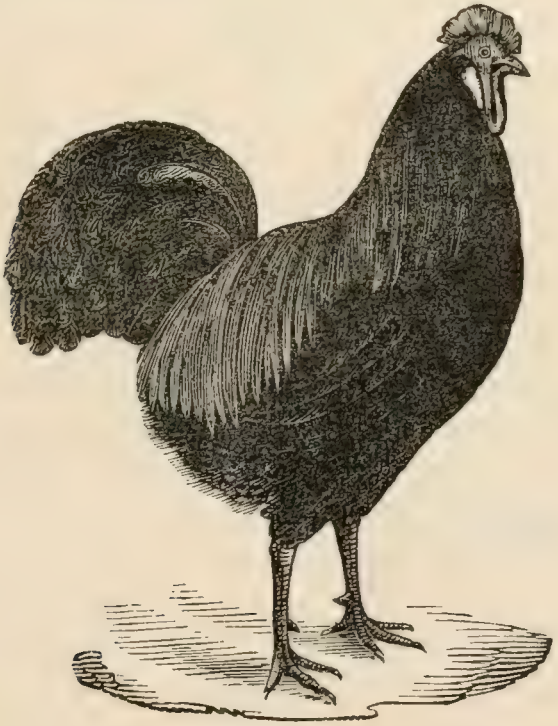
ing the most approved modes of keeping them, with especial reference to their profit as farm products. The statement of Mr. Howland, given hereafter, is valuable upon one branch of the subject suggested. Poultry and eggs we must have, and the more generally and economically they are produced the better will it be for the community.

The present exhibition shows pretty conclusively, that the "hen fever," so called, has nearly abated; and perhaps the abatement indicates the convalescence of the subject—of the prevalence of a more healthy public sentiment.

W. A. Hawley, *Chairman.*

Statement of Wm. A. Howland.

I present you with a lot of fowls, consisting of eight varieties, viz: the Chittagong, White Shanghae, Black Spanish, Bolton Grey, Poland, Dorking, Plymouth Rock, and a mixed breed; all comprising forty fowls.



I have had, during the present year, twenty-six hens and four cocks. The hens have laid, since the first of January last, 2,657 eggs, and reared sixty chickens. I keep the larger part of my hens in a yard, thirty by fifty feet, with a good shed facing the

south, where they roost and have their nests. I keep earthen nest eggs, which neither freeze nor decay. I always bring in the new eggs every night, and never break up the nests. If a hen desires to set, and I do not wish to have her, I shut her up a few days in an adjoining yard, about eight feet square, and then put her back with the rest of the hens. In a few days she will commence laying again. There is no hunting for nests. I have not had an egg spoiled by a hen stealing her nest for four years; and there has not been a day during that time but some one has laid.

I keep a box of dry ashes for the hens to roll in; and their roosts are made of sassafras poles with the bark on,—the bark being supposed to keep off the lice. I feed them with corn meal—mixed with warm water in winter and cold in summer, —corn, oats, boiled potatoes, meat, burnt bones, grass, and rowen hay. The greater the variety of food, the better. They want water at all times.

If a healthy ox or cow dies by accident, and the meat is not fit for family use, it may be salted for fowls. Boiled until it is tender, the salt will not hurt them; and they will devour it greedily, if confined and not able to obtain insects. Such meat is worth a dollar per hundred to use in this way; and perhaps horse beef would be good, but I have never tried it.

I have sold my eggs, the past year, for fourteen to twenty-five cents per dozen, and my chickens from twelve and one-half to fourteen cents per pound, dressed. One weighed eight pounds, dressed, and they have averaged four pounds.

As grain has been higher than usual the past year, I should think it had cost me two and one-half mills per day, to keep my fowls.

Conway, October 10, 1855.

HAMPDEN.

From the Report of the Committee.

The exhibition of poultry for the present year was quite meagre; but, though numerically less than on former occasions, the committee could not but rejoice at the disappearance of

those long-legged and ugly-formed creatures which formerly engrossed all the attention of fowl growers. The great Shanghae excitement is evidently dying away, and very much to the advantage of other varieties more worthy of consideration. There were exhibited this year some very good specimens of different varieties, but among them all there was no particular entry, which, in number and other respects, came fairly within the rules entitling it to premium.

The committee regret this falling off in one of the most attractive departments of the exhibition, and in respectfully inviting the society's attention thereto, they hope that such action will be taken as will induce fowl fanciers and fowl raisers to manifest greater interest in future exhibitions, by making more liberal contributions of choice specimens.

THOS. A. DENISON, *Chairman.*

PRODUCTS OF THE DAIRY.

ESSEX.

Statement of Samuel Carlton.

I present for your inspection a box of September butter.

PROCESS OF MAKING.—The milk is strained into tin pans and set in a cellar prepared for the purpose, and stands from thirty-six to forty-eight hours, according to the weather; but the cream is not suffered to remain on the milk after the milk is sour. Churn once in five days. The buttermilk is worked out by hand. The butter is salted to the taste. Salting by weight does not make it equally salt, as there is a difference in the strength of salt. Perfect cleanliness is very important in making good butter.

HAVERHILL, Sept. 25, 1855.

Statement of Nancy Holt.

This specimen of butter, presented for your examination, was made from the milk of three cows, during the present month. It is a sample of three hundred pounds made since May 20th. The cows have had common pasture feed only, until the first of this month,—since that, corn-fodder, once a day.

Process of Making.—The milk was strained into tin pans, and placed in a cool cellar; skimmed after standing twenty-four hours. The cream was put in tin pails, stirred daily, and churned twice a week. The butter is slightly worked when taken from the churn, to free it from buttermilk, salted with one and a half ounce of rock salt to the pound and left in a cool place for about twenty-four hours, when it is again thoroughly worked and shaped with clappers.

Haverhill, Sept. 28, 1855.

WORCESTER.

From the Report of the Committee.

It is a curious fact, however it may be with savages, that in proportion as men become civilized they grow fond of butter. They cling to it with the tenacity of a first and unsophisticated affection. Why it is that civilization should have the effect to lead us thus to lubricate our throats in a way entirely undesirable and incomprehensible to a hardier race, is not for us to determine. Sufficient it is for us that we are fond of the genuine article,—that the patriarch used it in his family and furnished it for the angel visitors,—and that our fathers and our grandfathers paid consistent homage to what may be aptly termed the only universal favorite of the present age.

Poor butter is an abomination which too many of our hotel and boarding-house keepers seem to lack the ability or the will to discover and execrate. To eat it is to degrade the physical, intellectual and moral nature of man. To furnish it for the table is such a wrong

"that one had need
Be very much a friend indeed
To pardon or to bear it."

To make it may not be the unpardonable sin; but it is a fault exceedingly difficult to forgive or forget. If the guilty in this respect could swelter, for a reasonable length of time, in a lake composed of the filthy stuff, though it would be a severe dispensation, it would probably in the end cure them of making, vending or furnishing the nuisance.

Good butter, on the other hand, is one of the institutions of society which commends itself to our careful consideration. Accurately defined, it is "an unctuous substance made by agitating the cream of milk till the oil separates from the whey." "An oily substance obtained from cream or milk by churning." In other words, it is the result of agitation applied to the right kind of materials. When Mr. Hunnybun, one of the Hunnybuns, said "if the sea were cream my boots would be full of butter, for I have been churning all day," his remark contained at least this lesson for agitators, viz: that it is of very little use to agitate unless we have the right kind of materials to set in commotion. Now when we get a churnful of cream, unless some law of nature fails, we can agitate to some purpose. How little do most of the simple-hearted butter eaters know of the labors and luxuries of this department of life! There may be the sweat of the brow, but there is also the flush of victory. However unintellectual the exercise may appear, it generally affords a practical illustration of the maxim that "in the end ye shall prevail, if ye faint not."

Churning, however, is not the whole of butter. The oily, unctuous substance is indeed separated by agitation. The next thing to be done is to discipline it—that is, the whey must be all extracted, the proper quantity of salt applied, and, unless the butter is to be used immediately, it should be placed in casks or other vessels, neat and clean, from which no unpleasant taste can be communicated to the butter.

To make good butter certain elements are generally essential —good cows, good feed, good salt, a good churn, and a good woman. As a general rule, the possession of the last item will go far towards insuring the first four.

A woman, the mistress of a dairy, who looks upon life as the field in which to glean for others and to fit herself for immortality, whose ambition it is, in quiet, unassuming industry, to do the duty nearest to her, is an object of admiration. She is

one of the producers of the earth. She is indeed a help-meet for man. "She looketh well to the ways of her household, and eateth not the bread of idleness." "Give her of the fruit of her hands, and let her own works praise her in the gates."

It has been well said that our New England farms are not so profitable in the crops they produce as in the boys which they raise. Who can tell how much of the patient industry and the ultimate triumphs of so many of our New England men has to do with the discipline and the moral of churning? Who does not regret the degeneracy of the age, which would allow a son to go into a shop or store, before he has learned to work upon the materials which God has furnished ready to his hands; before he has learned that Nature is the one great storehouse, that the farm feeds mankind, and the earth is the kind mother of us all? Who does not regret the mistaken kindness of many a mother, whose domestic virtues and accomplishments are her crowning glory, who is so tender of her fair-haired daughters, that, while she consecrates herself to the dairy and its concomitants, she consecrates them to the parlor with its music, its literature, its manners and its uselessness—with a gain indeed of what some call delicacy and refinement, but at a sacrifice of that health of body, peace of mind, and that true dignity of womanhood which always results from the performance of life's practical duties. The best thing a mother can do is to have her daughters do the next churning. If she has pursued such a system of green-house training that they are unfit for this, let her teach them to skim the milk and to do the needful for the butter after it has been churned. Let her teach them that the cream should be well taken care of—that the buttermilk should be thoroughly worked out of the butter, that in the absence of the "cylindrical," or lever butter makers," their delicate palms and fairy fingers are admirably calculated for this purpose, and may add sweetness to the article,—that the salt should be properly selected and thoroughly dissolved,—that the butter itself should then be moulded into tempting shape, fit for a republican; and if they are sensible girls, they will rejoice to follow their mother's advice, and will have the consolation to feel that they have done something useful and honorable. What though some shallow, graceless fop should be shocked at the washtub or the churn? Such fellows cannot be shocked too

soon. The whole race of them is not worth the clothes which they wear. Any man who would think less of his lady love because she helps her mother take care of the dairy, is unworthy of a decent woman. A wife who has been brought up with false notions of the substantial duties of life is liable to become a nuisance to an honest man's household. The man who can forget the hills, valleys and streamlets of the old homestead, ought to eat poor butter during the rest of his life; and the boys and girls who live and love among the true beatitudes of our rural homes, have strewed around them treasures to be gathered and cherished in the storehouse of memory, humble indeed in themselves, but rich in the elements of innocence and happiness.

HENRY CHAPIN, *Chairman.*

WORCESTER WEST.

Statement of Charles H. Davis.

BUTTER.—My way of making good butter is to set the milk in tin pans, about half full, in a cool place; let it stand two days then take off the cream, put it in a stone jar, with a little salt in it. It should be stirred every day, until churned. After churning, draw off the buttermilk and wash it in one or two waters,—for that will take out the buttermilk better than working it with the hands,—then salt to the taste. Let it stand twenty-four hours. Twice working over is sufficient for it to keep well.

Statement of Cameron Corbin.

The butter which I present for premium is made as follows: The milk was strained into tin pans, and set on the cellar bottom twenty-four hours for the cream to rise. The cream was then taken off, and stood five days, was stirred twice a day,—adding a little salt to keep it sweet,—and then was churned. The butter was taken out and worked with the hands until the buttermilk was worked out, then salted, then set away forty-eight hours, then packed for market.

Statement of Wilkes Roper.

BUTTER.—The milk is strained into tin pans half full, and set in a large room on the north side of the house. The windows, having blinds, are kept open night and day, excepting in very warm weather, they are closed in the middle of the day. It is kept from twenty-four to forty-eight hours, according to the weather, when the cream is taken into tin pails and kept in a cool place until churned. We churn two or three times in a week, as cream is injured by being kept too long. The butter is well gathered, then rinsed in pure, cool water, then taken from the churn and salted to suit the taste.

After standing two or three days, it is worked over by hand and lumped for market. Care is necessary not to keep the hand in contact with it long enough to make it soft.

Care is also taken to keep every thing used about the dairy sweet and clean.

Statement of A. H. Fay.

My manner of making butter is to set the milk in tin pans about half full, raised from the shelf on two narrow sticks, the thickness of a board, and let it stand, not over four meals.

The cream should be taken from the milk while sweet, and stand not over three days, and stirred every day.

After churning, the buttermilk should be worked out as much as possible before salting. No washing is necessary to make the butter keep well, for it will retain its flavor better without.

One ounce of salt to a pound is sufficient. It should be worked over the second day after churning, and put down in stone jars, and covered closely from the air, and kept in a cool, dry cellar in the summer, and above in the winter, and it will keep the year round—if you do not eat it.

Statement of J. P. Pillsbury.

My mode of making butter is to strain the milk into tin pans about two-thirds full, letting it stand thirty-six or forty-eight hours on a table or bench in the coolest room in the house; the cream kept in tin, and stirred daily, and churned once a week; the buttermilk thoroughly worked out. The butter is

then salted to suit the taste; the next day worked again and lumped for market. No cold water, artificial coloring, or sweetening is used.

WORCESTER NORTH.

From the Report of the Committee.

The duties of the committee were important and of a delicate character. They may be said to be peculiarly matters of taste, about which, it is said, there can be no dispute, but about which, of all things, there exist the greatest differences of opinion. Bread, butter, cheese, pickles and honey are articles which have about as close and intimate a connection with human existence, as the infinite succession of sweets and acids in our daily experience have in making up the sum of human happiness.

Of butter there was a fine display, both in quantity and quality. Fifteen different lots were offered, and, although most of it was good, and some of it very excellent, the committee found no difficulty in selecting those that seemed to them entitled to premiums.

E. Torrey, *Chairman.*

Fitchburg, Sept. 19, 1855.

Statements of George Miles.

On Butter.—The milk is strained into tin pans, to remain undisturbed from twenty-four to thirty-six hours. The cream is then taken from it, and deposited in another tin vessel, to remain two or three days, being careful not to close the vessel tight, and to have the room well ventilated. The churning is performed in the common flat churn, and the buttermilk expressed as thoroughly as possible, when it is taken into a tray and salted with one pound of the best salt and one teacupful of refined, pulverized sugar to sixteen pounds of butter. It is then suffered to remain for twenty-four hours, when it is again worked over and lumped for market or packed in jars.

Cheese.—We usually make but one curd in a day. The night's milk is strained into pans till morning, when the cream

that will have risen is taken off and the milk warmed to blood heat, when the cream is again returned to the milk and thoroughly mixed, (this is to prevent the appearance of an oily substance that would run off with the whey,) and the whole immediately laded into a tub with the morning's milk, and set for the cheese, with rennet sufficient to form the curd in about thirty minutes; and here much care is esteemed necessary in cutting and crossing the curd, and much moderation in dipping and draining the whey from it, that the white whey (so called) may not exude from it.

When sufficiently drained, it is taken and cut with a sharp knife to about the size and form of dice, when it is salted with about one pound of fine salt to twenty-five of curd. It is then subjected to a moderate pressure at first, gradually increasing it for two days, (in the meantime turning it twice a day and substituting dry cloths.) It is then taken from the press and dressed all over with hot melted butter, and covered with thin cotton cloth, and this saturated with the melted butter. It is then placed upon the shelf, and turned and rubbed daily with the dressing until ripe for use.

HAMPSHIRE.

Report of the Committee.

The committee awarded premiums on the following principles:—

Flavor, color and form indicate the character of butter. Flavor is first in importance, color the second and form the third. Of two lumps of butter, flavored alike, but of different color, that which has the deepest color is the richest and most pleasant to the palate. And the nicer the form—other things being equal—the better is the article, for the eye, which loves to discriminate, is then gratified as well as the taste. She who can make butter of fine taste and rich color, and impress on it a beautiful form, is worthy of a premium, and will do her husband good, and not evil, all the days of her life.

The competitors furnished statements of the process of butter making. Would it not be well, in future, to state how the cows were fed; what kind of churns were used; how long it takes

to bring the butter; and whether a discovery has been made for preventing or removing "the witchery" which sometimes gets into cream, and which tries the patience and tasks the strength of those who toil at the churn.

The statements of the successful competitors for premiums have been preserved, and what is peculiar to each is here given, with some verbal variation and curtailment.

Milk is uniformly strained into tin pans, and generally stands in a cool, airy place, from thirty-six to forty-eight hours. The cream is put into tin or stone and daily stirred.

No. 1 says, cream is churned twice a week. After churning, the butter is thoroughly washed, before it is taken from the churn, then worked and salted, and after a few hours worked again and formed into lumps. No. 2. Milk strained into a tin pan and set in a boiler of hot water, till at a temperature of 120°; then put in pans in a cool place, thirty-six to forty-eight hours; cream stirred often, so as to have all that is to be churned at a time well mixed twenty-four hours before churning; cream at a temperature below 60° when churned; one ounce of salt to one pound of butter; second working twenty-four hours after first. No. 4. Cream is stirred and salted when new is added. No. 5. Cream is stirred, morning and evening, and churned twice a week. No. 6. Churning once in four days. No. 7. Churned in a crank churn. No. 8. Skim the cream as free as possible from milk; for one quart of thick cream stir in a table spoonful of salt; when churned to butter, add one ounce of salt to a pound; work out all particles of buttermilk at the last working.

W. H. Beaman, *Chairman.*

HAMPDEN.

From the Report of the Committee.

Butter.—The number of entries in this part of the exhibition was limited, in comparison with former years, and the committee attributed the cause to the fact that the rules of the society now require specimens for exhibition to be made in the month of June, thus testing the skill of the maker more thoroughly than heretofore, or when butter made only the day previous could

be placed in competition for premium. The committee coincide in the propriety of requiring a more thorough standard of excellence, fully believing that butter which will not bear the age of four, or even six months, without deterioration, is, to say the least, improperly made.

J. P. Ely, *Chairman.*

From the Report of the Committee on Cheese and Honey.

The association of cheese and honey forcibly reminds the committee of Samson's riddle; not that they had any very particularly strong cheese presented for examination, but because it is sometimes so manufactured as to be strong, and with honey there is always an idea of sweetness connected.

Seven samples of cheese were entered, which, in our opinion, were all good; but it may be well to define our position as to what we consider good cheese. It is that which has a mild, pleasant and rich taste, well cured, or ripe, and which has not been salted, scalded or pressed so much as to be rendered dry and hard. The committee will not here undertake to describe the best of the many methods of manufacturing cheese; but if some better and more general rule for preparing the rennet, salting the curd, pressing and curing the cheese, were adopted in this county, the general character of this valuable product would be much improved. It is to be regretted that our dairymen and dairy-women do not take more interest in our annual exhibitions, for it is certain that there are very many fine dairies of cheese, particularly in the western part of the county, where from twenty to thirty-five cows are milked, which, if represented here, would be advantageous to their owners and a credit to the county.

Some of the specimens on exhibition this year were green, and not sufficiently cured to show precisely what they would have been if perfectly manufactured; otherwise they might perhaps have been considered as "A No. 1."

W. E. Boise, *Chairman.*

NORFOLK.

From the Report of the Committee.

The duty of the present committee on dairy is confined to a consideration of the two articles of butter and cheese, of which specimens may be exhibited,—several subjects which might receive attention under the general head of Dairy being very properly assigned to special committees, as those on "milch cows," on improving "old pasture lands," (very important,) on "food for cattle," "soiling," &c.; and the committee for the State's premium on dairy.

Of the value of butter and cheese, as articles of food, and their economical importance in the management of farms, your committee need not speak. It is desirable that growing attention be given to them by American farmers, care being taken to produce those of the best quality, whether for the foreign or domestic market. No American farmer should be satisfied till he can produce butter and cheese which will bear comparison with the best product of foreign lands.

Butter has been known from a remote, though not the remotest, period of antiquity. The Jews do not appear to have been acquainted with it, at least in its solid and concrete state. It is true the term occurs several times (ten, we believe) in our English common version of the Old Testament. But the best critics now pronounce the translation erroneous. In recent critical versions the Hebrew word is translated "milk,"—thick milk or cream, perhaps. Thus, Job xxix. 6: "When I washed my steps in milk," instead of "butter." Again, in the celebrated passage, Isa. vii. 14, "Milk and honey shall he eat," instead of "butter and honey." Some may fancy that they find express mention of butter in Prov. xxx. 33, in king James' version, "Surely the churning of milk bringeth forth butter." But the translation, "the pressing of the milker bringeth forth milk," certainly comports better with what follows, "the wringing of the nose bringeth forth blood." One distinguished critic renders the line thus: "the pressing of milk brings forth cheese," more likely than "butter."

The Greeks and Romans were not originally acquainted with

butter. The Greeks derived a knowledge of it from the Scythians, or Thracians, and the Romans from the Germans. Milk and cheese are spoken of by the old Greek writers from the time of Homer, but not butter. Hippocrates, in the fifth century before Christ, is the first Grecian writer who mentions it, referring its origin to the Scythians. Herodotus, the father of history, in the same century, describes the process of making it among the same people. The Scythians probably owed the discovery to accident. The milk, which in their frequent wanderings they took with them in skins, would, by agitation, exhibit particles of butter, and this suggested the process of churning, a process originally rude and simple.

Butter was very little known, however, either among the Greeks or Romans, till a comparatively late period. The first recommendation of it, as an article of food, is by Dioscorides, a little before the time of Christ. He mentions its medicinal or healing virtues, on which Galen, who wrote two hundred years later, is more full. Galen affirms that he had seen it made of cow's milk, though Dioscorides makes mention only of sheep and goat's milk. Pliny ascribes its invention to the "barbarous nations," that is, as he generally uses the term, the ancient Germans and Britons; and says, that it was made from the milk of the sheep, the goat, and the cow.

Still it was little, if at all, used as an article of food, the recommendation of Dioscorides notwithstanding. It was used in medicine, and as an ointment in baths, and sometimes, as among the Egyptian Christians, was burned in lamps instead of oil. In the ancient Roman Catholic churches its use in lamps was sometimes permitted, when oil failed. The ancient butter, however, appears to have been a very inferior article; it was not solid, or concrete, like ours, but liquid, and is always referred to as poured out, and not cut.

Butter is mostly used in the more northerly countries of Europe. In the southern, where olive-groves abound, its use is, in a great measure, superseded by that of oil.

The making of good butter is an art. Its good or bad quality is sometimes attributed to food or pasturage; and this has an effect, no doubt. Certain it is, that particular plants fed upon by cattle, impart a flavor, sometimes disagreeable, to butter. But more, we believe it is now admitted, depends on the making.

Speaking of Great Britain, a writer whose opinion is entitled to great respect, says: "In every district where fine butter is made, it is universally attributed to the richness of the pastures, though it is a well-known fact, that, take a skilful dairy-maid from that district into another, where no good butter is usually made, and where, of course, the pastures are deemed very unfavorable, she will make butter as good as she used to do; and bring one from this last district into the other, and she will find that she cannot make better butter there than she did before, unless she takes lessons from the servants or others whom she finds there." The "peculiarly rich and delicate flavor" of the butter of the Highlands of Scotland this writer ascribes not to the "old grass on which the cows feed in those remote glens," but to the process of working. He observes, in this connection, that cream from the milk last drawn from the cow is as superior in quality to that from the milk first drawn, as in quantity —an argument for thorough milking, if there were no other.

"The particular nature of Bretagne butter, whose color, flavor and consistence are so much prized, depends," says a French writer, "neither on the pasture, nor on the particular species of cow, but on the mode of making."

It is not, of course, meant to be asserted by your committee, that there is no difference in animals, nor in food or pasturage, affecting the quality of the butter produced by them; but they are desirous of drawing attention to improved modes in the making, for which there is certainly room.

Of the best produce of butter on a farm, for four months, with accompanying statements, quantity as well as quality being taken into view, the committee regret to say, that there was this year no presentation.

A. Lamson, *Chairman.*

PLYMOUTH.

From the Report of the Committee.

The committee on products of the dairy have attended to the duty assigned them, and beg leave to report that the contributions are unusually large, and manifest an increasing interest in this department.

From twenty-two lots of butter, in consequence of the general excellence of the article, the committee found much difficulty in selecting five entitled to premium. They would, however, recommend the following awards:—

To Mrs. J. L. Bassett, of Bridgewater,	1st premium,	$7	00
" H. S. Davis, of Plymouth,	2d "	6	00
" Willard Wood, of Bridgewater,	3d "	5	00
" Copeland, of West Bridgewater,	4th "	4	00
" L. D. Holmes, of Bridgewater,	5th "	3	00

The committee would suggest to future contributors of butter that it would be well for them to send their contributions in stone jars. They found one exceedingly handsome lot packed in a box newly painted upon the inside, which tasted so strongly of paint that the true qualities of the butter could not be tested. Other lots in wooden tubs tasted slightly of the wood, and these lost that excellence which very probably they originally possessed. The committee would call the especial attention of future competitors for premiums to this suggestion.

R. Perkins, *Chairman.*

FRUITS AND FLOWERS.

ESSEX.

From the Report of the Committee on Fruits.

The show of fruits, particularly apples, was as fine as at any previous exhibition, and the number of contributors and the quantity of fruits exhibited indicate a continued and growing interest in this society. But in order to show our collection to advantage, we require a room as large as Faneuil Hall in Boston. There were upon the tables eleven hundred and eight plates of fruit, from one hundred and fifty contributors.

The liberal premium our society has offered for the production of a hardy grape, equal in quality to the Isabella, " ripening in this county in the open air by the middle of September, prolific and suitable for the table, the same to be tested by the commit-

tee two years," we have not as yet seen; but as the new hybrid grape of J. F. Allen, of Salem, approximates to this desideratum, and as he as well as some others are now raising seedlings from year to year, we have no doubt that ere long this great addition to our list of this wholesome and excellent fruit will be forthcoming. We say wholesome fruit, for, as Prof. Salisbury has clearly demonstrated, the "free use of ripe grapes and apples not only prevents disease, but their regulated enjoyment helps to remove that which already exists. They are superior to the potato in the principles that go to increase the muscle and the brain of man." Ripe grapes have cured epidemic dysentery. Families where fruit is most plentiful and used as an article of food are most free from disease of all kinds, and more especially from fevers and bowel complaints. Most fruits aid digestion, some directly, some indirectly, and lessen the desire for alcoholic or stimulating drinks.

With regard to the best soil for fruit trees generally, but more especially for the pear, much has been said and written; and, although we can and do produce as fine apples and pears as are to be found elsewhere, yet a pretty careful observation of several years has convinced us that a light sandy loam, (a most common soil, of which a great proportion of the fruit gardens in our county is composed,) is not the most proper. From the easy manner in which it is worked, owing to its loose nature, and the quickness with which, from its warmth, trees come into bearing, it is looked upon with almost universal favor. On the contrary, we believe that, under the bright skies of July and August, a fruit tree requires a soil which will retain and afford a moderate and continued supply of moisture, and here the sandy soil fails. In consequence of this, the vigor of the tree is checked, and it becomes feeble in its growth, and is comparatively short-lived, or at least unproductive.

JOHN M. IVES, *Chairman.*

From the Report of the Committee on Flowers.

The committee on flowers having attended to their duty, respectfully report:—

That no former floral exhibition in this society has been equal to the present. Their only regret is the want of means to

reward the generous and tasteful exhibitors of these beautiful gems of nature, somewhat in proportion to their merits.

Productions of the orchard, the vineyard and the field, also help fill and crowd your halls. They all originate in flowers, and, although exceedingly tempting to the mere animal taste, they are but the material of apple dumplings, johnny cakes, beef, pork and fast horses. They still receive high, honorable premiums, while flowers—bright, fragrant, beautiful flowers, "parents of all the vegetable world,"—have only a trifling "gratuity." Well may the fig tree refuse to blossom under such a dispensation.

No one who has a note of music, or a love of the beautiful in his soul, can contemplate these magnificent contributions from the flower gardens of a Lawrence, an Oliver, a Walker, a Thornton, a Harmon, a Minot, a Gardner, a Turner and others, without admiration for the refined taste of producers, and a most lively sense of gratitude for such unmistakable evidences of a divine purpose in the "Father of all" to feed the high moral as well as the physical wants of all his children. Such a display of beauty, innocence and purity, in floral gems, is worthy of man. It gives an almost unappreciable charm to every other department of your exhibition, and prompts us most earnestly to ask that future committees on flowers may not want, as we do, more abundant means to encourage even the most humble efforts to cheer and beautify the earth, and your halls, with these wonderful productions.

However much may have been said or sung in praise of floriculture, its importance in harmonizing the discordant elements of humanity has never been duly appreciated. The child, whose early life is devoted to a pure love of the beautiful in nature, is almost sure to have a future unfailing love of his home, his country and his God. The home of the free Switzer is said to be sacred to him by his recollections of cultivating flowers in childhood. It nerves his arm in his country's defence. Pure patriotism is not the mushroom production of a night. "It grows with our growth and strengthens with our strength."

One recollection of a happy childhood is far more efficient in the salvation of one's country than a thousand aspirations after political preferment. As wealth is valueless without the means of securing its possession, what can utilitarians even, who scorn

whatever answers no material purpose, devise more useful to our country than the means of arming its rising population, its future champions and defenders, with that imperishable love of home which will nerve their arms, and render them invincible, should their rights be invaded?

Flowers, like their Author, are impartial to all. They cheer the boundless prairie, the mountain top, the lowliest valley, the rich man's palace and the poor girl's pathway. Like music, painting and poetry, they are universally appreciated. They elevate the affections, and arouse the God within the soul, whether in saint, in savage or in sage. They speak to none an unintelligible language. Even from the lowliest flower each attentive listener hears, in his own tongue in which he was born, "the wonderful works of God." New Englanders, Missourians, Nebraskians, and dwellers about Oregon and California and Australia; Africans, Patagonians, Siberians, Russians, Greeks, Turks, Germans, Frenchmen, Englishmen and strangers of the Crimea, about Sebastopol; Chinese and Hottentots; all may hear from "the lilies of the field"—in a language, too, alike intelligible to all—the same old story, that the Creator of all cares alike for all.

"Observe the rising lily's snowy grace;
Observe the various vegetable race;
They neither toil, nor spin, but careless grow;
Yet see how warm they blush! how bright they glow!
What regal vestments can with them compare?
What king so shining, or what queen so fair?"

"Man's inhumanity to man" never originated in the divine teachings of nature.

"The face of nature is God's written Bible,
Which all mankind may study and explore;
None, none may rest, interpolate, or libel
Its living lore.

"And from its pages we may gather
That every sect should love alike all others;
Christian, Jew, Pagan, children of one Father,
All, all are brothers."

Earth has no reluctance to becoming the abiding place of universal peace and happiness. Her darkest place, even her

Ethiopia, is ready to stretch out her hands unto God, whenever her children can agree to be happy, to live peaceably together, and mutually to aid and comfort one another. No good reason seems to exist why all nations may not learn to read alike from the volume of nature, of which flowers form a bright, glowing alphabet. Gladly would we see the means of cultivating flowers in the hands of every son and daughter of our race. It is the universality of flowers, rather than the aristocratic greenhouse, which is to bless and harmonize the world.

And here we cannot forbear to mention a most aggravated evil, that there are seedsmen of the present day, who at high prices sell seeds, not one in a hundred of which, they well know, will vegetate, and of those which do germinate, scarcely one to a hundred will prove true to their label. To obviate this evil, many cultivators are returning to the good old way of raising their own seeds from their choicest stocks, and exchanging their superabundance for other choice varieties with their neighbors.

It should be known that more than twenty choice varieties of flower seeds may be sent three thousand miles for one letter stamp. The Andover Horticultural Society, which has been in successful operation four years, has taken advantage of this governmental privilege, and gathered to itself rich treasures from all sections of the globe. Besides its transatlantic exchanges, it has within the past year exchanged more than six hundred packages of many varieties of seeds, with individuals in seventeen different States of the Union. No seed of a beautiful flower, no element of a desirable vegetable, should be wasted. Somebody wants it, and will gladly repay in something more valuable to you all your cost in transferring it to them. We cannot close without saying, that the refined taste of the citizens of Haverhill has come up most admirably to this occasion, and proved themselves worthy "to have and to hold" frequent similar exhibitions in their beautiful town. Nor would we neglect mentioning the exquisite presentations of Michael Moriarty, who, as the gardener of Samuel Lawrence, Esq., is universally acknowledged the "Michael Angelo" of floriculture in Andover. Nor less meritorious is John Hart, of Gen. H. K. Oliver's garden, whose magnificent dahlias have not been equalled the present season at any horticultural exhibition in the State. The

gigantic and magnificent pyramids of flowers presented by George J. Thornton, professional horticulturist, of Lawrence, evinced artistic skill and a zeal for beautifying your hall worthy of all commendation.

Other beautiful contributions were presented, but not having the names of the worthy donors attached to them, due justice cannot be done to their merits. The magnificent basket of artificial flowers, by Mrs. Edward Hodges, of Salem, is "a thing of beauty," but belongs to a different department. Hoping that all contributors on this occasion may find the path of life abundantly strewed with thornless flowers, your committee respectfully submit the foregoing report.

EASTMAN SANBORN, *Chairman.*

MIDDLESEX.

Report of the Committee.

GRAPES.—The show of grapes was not so good as that of 1854; this was probably owing to the less favorable season of 1855. The mildew affected the grape more than usual, and the early frosts prevented the late varieties from ripening.

Many native varieties were exhibited, none of which appeared to your committee to have any merit beyond that of early ripening and large size, some of them being nearly one and one-half inches in diameter.

Three varieties of seedling grapes were entered for premium —the Concord, by E. W. Bull; a seedling from the Isabella, by Mr. Gammell, of Lexington; and an amber-colored seedling, by Mr. Clement, of Dracut.

This latter grape is not remarkable for high qualities, but has an agreeable and rather acid flavor, a thin skin, and less pulp than the wild grape. It is an improvement on the wild grape, and promises to be a good breeder, and we think Mr. Clement will be able to get some good grapes out of it.

The seedling from the Isabella was a black grape, of rather harsh flavor—this may improve with cultivation—compact bunch, of medium size, and, like all seedlings from the Isabella known to your committee, much inferior to that grape.

The Concord fully maintains the high reputation which it has attained, as the best seedling grape yet raised. Three bunches, weighing two and one-half pounds, and growing on one spur twelve inches long, were exhibited by the originator. They looked like fine specimens of the Hamburgh, and excited the admiration of the beholders. If it maintains its reputation—and after six years of trial we consider this assured—it is the greatest acquisition yet made to our hardy grapes.

This grape was raised from seed by Mr. Bull, about twelve years since, from another seedling already obtained, with intent to test the "Van Mons theory" of successive reproduction and consequent amelioration. Mr. Bull has devoted himself to this purpose for many years. His success has only stimulated him to new efforts, and he has now thousands of seedlings, some of which show a marked change of foliage and wood from their wild prototype, and give promise of still further improvement.

The terrible oideum is infecting all the wine districts of Europe. It is said that the wine crop of this year will not be one-fifth of the former average yield, and this is the third year of failure; so that the vintagers are, many of them, cutting up their vines and planting corn. The vineyards of Madeira are said to be nearly exterminated, and her inhabitants to have suffered actual want. The golden vintage of the Madeira "South Side" bids fair to become a myth and be forgotten. It is written that the Old World shall find its rejuvenescence in the New. Is it not possible that she will find among our American grapes the alternative for his too tender Syrian brothers, some vigorous congener which shall laugh to scorn oideum and all other grape-like weaknesses and debilities? And if, in these peaceful triumphs of practical art, in horticulture as in other arts, we shall in some measure repay to the Old World the obligations laid upon us by a Duhamel, an Evelyn, a Van Mons, a Loudon, then shall we have achieved more than an annexation: we shall have created—we shall have given.

Our New England climate is not adapted to the foreign grape; our summers are too short, our winters too severe. Nor do the best varieties of native birth, such as the Catawba and Isabella, succeed, except in cities or sheltered situations. Plainly we must have another grape; hardy it must be as our native oaks;

early, to escape the frosts which often come before September leaves us; prolific, that we may reap a rich reward for the labors of the season; and, if possible, large, handsome and good. Can we not get all this? The grape is native here from the beginning of our history. The Vitis Labrusca is found, wild and rampant, from Maine to New Jersey; and is adapted by its structure and its habits of a thousand years, to our climate with all its vicissitudes. Why should not this wilding yield to the skilful horticulturist the grape we are in search of, since it is already what we want in the important characteristics of earliness and vigor. If Van Mons obtained from the wild pear of the hedge row, by successive reproduction, those fine pears now so well known to the horticultural world, why may we not expect similar results in raising seedling grapes, and that, too, without waiting the half century which the patient Belgian devoted to his task?

The truth is, many seedlings have been raised, and although much has not been done, several grapes of merit have rewarded the efforts of intelligent horticulturists in various parts of the country.

The Graham grape, a Philadelphia seedling, not hardy here in Middlesex, but much liked in more favorable localities; the Delaware, a new grape, said to give a good promise; and the Concord, the new seedling of Middlesex county, are before the country; and the last has excited, more than any other, the attention of horticulturists, from the fact that it is the first good grape that has yet been raised from our indigenous vine; and the habit of its wild prototype being broken, it promises still further amelioration, so that we may confidently expect to have grapes equal to the best foreign varieties, hardy enough to be grown in every garden in New England.

We have obtained from Mr. Bull a few hints in raising seedling grapes, which we think may be of interest to those who are raising, or intending to raise seedling grapes, and therefore add them to this report.

Select your seeds from vines which have a vigorous habit of growth, bear early and good fruit, and which have a large foliage thickly ciliated on the under side, but smooth on the upper surface and strongly nerved; these are the usual characteristics of our native vine, and indicate vigor and freedom from rust or

mildew. Plant the grapes whole, in a good soil, rich, and mixed with vegetable mould; cover the grapes one inch; if they are planted in the autumn, which is the best mode, they will come up freely in May; they must be kept free from weeds, and watered if the weather be dry. The vines which come up the first year will usually be very robust, and you will think you are in the high road of success; but these strong vines of the first year will very generally prove barren. The second year there will be a new crop of seedlings from the same sowing; and even in the third year they will continue to come up. These seedlings of the second and third year will give you your improved varieties.

It is probably due to this fact that there have not been spontaneous improvements of our native grape. The vigorous seedlings of the first year, which are nearer to the original type, smother and prevent the growth of the more feeble vines which come up in the second and third years, and which alone bring the improved type, which is a departure from the original, requiring the hand of the horticulturist. Make room for the second year's seedlings by removing the first year's crop; do this without disturbing the seeds; put a fork deep into the ground in the early spring, when the ground is pretty wet and soft, and gently loosen the earth and lift the vine you want to remove carefully out the ground; do this again at the end of the second and even the third year, as the seeds often come up even in the fourth year. It is of course better to sow the seeds of the Concord grape, than to go back to the beginning and sow the wild grape.

WILLIAM D. BROWN, *Chairman.*

WORCESTER NORTH.

From the Report of the Committee.

It cannot be otherwise than a source of peculiar gratification to every lover of fine fruit—and who is not?—to witness the annually increasing display presented at our autumnal exhibitions. The increase in quantity and variety of specimens of the more valuable fruits affords substantial evidence of that "good time coming," when Pomona's best productions, instead

of being luxuries accessible only to the few, will be produced in such quantities, and furnished at such rates, as to place them within the reach of the whole community as articles of common use. A glance at the nursery business affords additional evidence of the same thing. It has been estimated, by one well qualified to judge, that the sales of trees throughout our Union amount in value to upwards of a million dollars annually, and the amount increases with every season. Nurseries have been drained of every thing worth cultivation, and very much of that which was worthless. So great, indeed, has been and still is the mania for tree planting, that well-informed persons have expressed fears that the whole matter of raising fruit, with the view of profit, would be "run into the ground." That fruit would become so common that the market would be glutted, and that as a speculation in the hands of the producer it would prove an entire failure.

Let us consider for a moment how the case stands at the present time. Are we really in danger of becoming surfeited with an overabundance of good fruit? Has our experience during the past few years been such as to justify this conclusion? We think not. So far from the market being oversupplied, there are very many people who have never even tasted some of our finest varieties of fruits. They are not yet produced in sufficient quantities to get into the markets at all. This is true of even our staple fruit, the apple. When we think for a moment that the Baldwin, an apple of which there is probably nearly as many raised in this region as of all other marketable apples together, never wants for purchasers in the years of its greatest abundance; that it always commands very high prices in the spring, in common with all late-keeping apples, and that the constantly increasing demand for many kinds of winter apples, more especially sweet apples for shipping, is one which will for a long time prevent the price of such fruit from reaching a point below which it would cease to be remunerative, it certainly does not appear that the orchardist need to entertain fears that he is wasting his time or money in planting and cultivating such trees. Then, again, to glance at the pear, a fruit raised with much more difficulty than the apple, it is true, and correspondingly more valuable. With the exception of some few of the inferior varieties, this fruit is

almost out of the reach of the majority of the people. Even the Bartlett, a pear sustaining a similar relation to others as does the Baldwin among apples, is by no means to be obtained at otherwise than luxurious prices, notwithstanding that the demand for it is very much diminished by the fact that its period of maturity is shared by the peach, a very formidable rival, both in its quality and price.

But it may be said that among the millions of trees that have been set within the last five or ten years, but a small number have, as yet, produced fruit in any quantity, and that until the majority of them begin to bear fair crops, the effect upon the market will, of course, be hardly felt. We are not, however, of that class who indulge fears of this nature. We are unable to believe that the better qualities of fruits will ever be purchased, unless as an occasional exception, at prices which will fail to handsomely remunerate the intelligent producer for his outlay and trouble; and we are strengthened in this conviction while taking a survey and learning the history of a large portion of the trees which have been set within ten years past.

Trees have often been purchased of an irresponsible nurseryman, or perhaps some travelling agent who could tell a very plausible story of the great value and cheapness of those which he wished to sell. The varieties of which he had the greatest stock on hand, were always those that he recommended as being particularly worthy of cultivation, even if he differed with all good judges, a fact of which his customers did not possess information. If the trees were raised upon a poor soil, he would insist upon it they were much better for not having been "forced." In planting out, trees have been placed in soil without the least preparation, in holes just sufficient to receive all the roots, with a little crowding. The bruised ends of the roots left untrimmed, and the whole operation, in fact, performed very much as a fence post would be set, and the tree is too often rivalled in its growth by the post.

These modes of treatment, however, we are happy to believe, are practised less generally than they were a few years since. Better ideas have begun to prevail among tree planters. A fruit tree is getting to be considered as having an organism endowed with life, and governed by similar physiological laws as are other living things. Its wants and necessities are becom-

ing better understood and appreciated, and we have corresponding hope for the future. But that this knowledge is not shared by the whole community every day's observation compels us to believe.

When we see a fruit tree, of any variety, that has been set from one to five or ten years, having in that time made but a comparatively trifling growth of wood, surrounded by a tough sward, or what is perhaps quite as common, and fully as detrimental, a thrifty, rank growth of a circle of weeds and suckers, abstracting from the soil all those nutritive elements that should have been appropriated by the tree itself, which latter receives no accession of wood from year to year, but becomes covered with moss, and bears all the marks of premature old age, we are forced to the conclusion that the owner is either ignorant or grossly negligent. That he is either quite unaware of the mode in which the tree obtains its limited supply of nourishment from the soil, or that he is entirely careless of its cultivation, because its crop is not a marketable one. He does not appreciate the fact that the thrifty growth of a fruit tree is worth infinitely more for a few years than its meagre crop of imperfect fruit. The difficulty is with him as with some corporations which have closed their construction account prematurely, and are consequently obliged to pay their first dividends in stock: he closes his construction account the moment the tree is planted, and expects his dividends without further effort, whereas this account should certainly not be closed until the tree pays full dividends of fruit, for the small amount of labor and attention annually required will be most abundantly repaid in the increased quantity and improved quality of the product.

We might estimate in merely an approximate way the value of the annual growth of a tree somewhat as follows:—

First cost, ...	$0 35
1st year's growth, valued at . . .	10
2d " "	20
3d " "	30
4th " "	45
5th " "	60
6th " "	80
7th " "	1 10

8th year's growth, valued at	.	.	$1 50
9th " "	.	.	2 00
10th " "	.	.	2 60
			$10 00

By this estimate, the value of a tree in ten years from setting would amount to $10, which, for an apple or pear, cannot be considered as too high. Because at this age such trees, well cared for, are generally in a condition to produce a crop, the average annual value of which is sufficient to pay the interest on a much larger sum, in fact, often to ten times this amount. What more profitable occupation then can the farmer pursue than to bring a portion of his land into orchard. Even if he is a man that looks at the present entirely, the annual increase in value of his farm, in consequence of the accumulation of fruit trees, will always command a price more than enough to cover the whole expense.

To every man, then, we say, plant fruit trees; but what is of more importance, cultivate and care for them with the same zeal that you bestow on any other crop, and you will be sure of a return that will fill your heart with satisfaction and your purse with something useful.

Apples.—In this department, although the specimens, as a whole, were not quite equal to those of last year, yet the display was a good one, and in some respects unequalled by those of previous years. We hail with much pleasure the introduction of such varieties as the Gravenstein, Minister, Hunt Russet, and some others. There were some very fine specimens of the Northern Spy, grown on scions, three years set, giving fine promise. Much too large a part of our collections is made up of such apples as the Cathead Sweet and Blue Pearmain, apples entirely unworthy the attention given to them, while so many superior varieties may be obtained for the asking.

Pears.—Of this fruit the display of varieties was quite in advance of last year. We noticed fine specimens of many that are but little known, but of good promise. For one pear, the Flemish Beauty appeared to stand first, even before the Bartlett, which is this year hardly up to its reputation.

Of peaches the display was quite unexpected. They were

shown from quite a number of sources, and in one instance five varieties were from one contributor. The Early Crawford, as usual, carries off the first premium.

In the matter of grapes, the committee have refused to acknowledge the Isabella as No. 1, and for these reasons:— When asked which was the preferable grape upon the tables, to be eaten *now*, it was the unanimous opinion that the Early Northern Muscadine stood first, and the early Amber next. Both these grapes were ripe, and the first quite so, while the Isabella was quite immature. In this vicinity the Isabella does not attain maturity oftener than once in three or four years, which fact is sufficient to effectually prevent its cultivation as a matter of profit. The others, although the berries are more foxy than the Isabella, especially in their perfume, are good growers, perfectly hardy, and the fruit is sure to ripen. The Early Northern Muscadine comes from Lebanon, New York, and the Early Amber from Harvard, Massachusetts. The display of the intolerable fox grape was, as usual, very large, and needs no encouragement.

We cannot close this part of our report without expressing our satisfaction with the method adopted this year, of numbering the various collections, rather than placing the names of the contributor upon them. By this plan the committee are able to make up their awards in a perfectly impartial manner, giving premiums to the specimens, instead of, as is too often the case, to individuals.

JABEZ FISHER, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Report of the Committee.

Your committee have the satisfaction of being able to report, that while in no respect does the exhibition in their department fall behind that of former years, the samples, in many varieties of the products offered, display a development and beauty far in advance of previous exhibitions.

Following the usage of former committees in this department, your chairman,—to familiarize himself with the subject,—at the start, took a census of the fruit-bearing plates and dishes, as

they were arranged for the final review; and, as if there were "luck in odd numbers," they summed up exactly five hundred and one! But this would be but a partial testimony indeed, whether to the bounty of Heaven or the generosity of the contributors, did we not go further, and say that the fruits and products of every variety were present in such abundance, as to make it manifest that those who had presented them had found not so much difficulty in selecting out of their luxuriant stores specimens which were worthy to appear in public and compete for rewards, as to find specimens insignificant enough to stay at home, content to blush unseen, and to ripen in retirement.

Mr. W. A. Arnold exhibited fifty varieties, including what he calls "seedlings;" Mrs. S. B. Woodward, twenty varieties: and Mr. William Clark, sixteen varieties. Some of your committee were a little in doubt, from what they knew of Mr. Arnold's trees, whether the "seedlings," so called, were in strictness entitled to be treated as any thing more than any mere unimproved native fruit. We should have been glad to learn from Mr. Arnold whether his "seedlings" were taken from old trees, bearing merely supposed native fruit, of unknown antecedents, or whether from trees raised by him from the seed; and if the latter, then learn to what generation from the seeds first planted the specimens on exhibition belonged. Data of this sort would enable us to appreciate more satisfactorily a theory sometimes propounded, that the fruit in the fourth generation from the primary seed attains to its perfect development, and is then entitled to take rank as a "seedling" variety. But it will be seen from our award that queries of this sort have, in the result, detracted nothing from the otherwise ample merits of Mr. Arnold's strictly standard varieties.

While inspecting the department of apples we were surprised to find only two plates of an old and favorite variety, sometimes called the Matthews' Stripe, and sometimes the "Lyscom" apple. These came from trees of William Clark and Robert Carter, of Northampton. A fruit of such excellent qualities should not be crowded out of public favor by second-rate novelties.

In the department of pears, the committee recognized as the best collection, the sixteen varieties exhibited by John W. Wilson, the secretary of the society; and they accordingly award

to him the first premium of $2. Mr. Wilson's title to the society's distinctions stands scarcely less on his well-known devotion to fruit culture than his zeal and diligence in discharging the duties of his secretaryship. There is, moreover, connected with his pear trees, a history quite instructive to those impatient husbandmen who refuse to plant trees because they cannot exact an instantaneous return of fruit. We well remember seeing, about five years since, in mid-winter, some of the pear trees whose fruits graced the present exhibition, travelling, with immense balls of earth about their roots, supporting trunks ten or twelve inches in diameter, in stately procession through Main and King Streets, and finally bringing up at their place of destination on Mr. W.'s grounds on North Street. This is the true way of keeping pace with a fast age.

Cranberries, grown on upland, were exhibited by James Ellsworth and E. B. Fitts, of Northampton. These samples, and the great difference between them, not only demonstrated that this invaluable berry thrives well on garden soil, but that it is as susceptible of high improvement by careful cultivation as other garden plants. Mr. Fitts, by cultivation, had produced a berry twice the size and much fairer than those of Mr. Ellsworth, which had received no special care.

We should be unmindful of the claims of taste, skill, and liberality in the floral decorations of our department, did we not express our thanks to Miss Julia Shepherd, Messrs. Joseph I. West and Nathan Storrs, for their various and beautiful contributions of flowers.

And with this expression of the society's acknowledgments for the renewed kindness of its friends,—imperfectly requited by any tribute of ours,—we reluctantly take leave of the exhibition of 1855.

CHARLES DELANO, *Chairman.*

VEGETABLES.

Sweet Potatoes.—The following communication in reference to the cultivation of sweet potatoes has been received from Caleb Bates, Esq., of Kingston. He says:—

For seven years I have been experimenting on the cultivation of the sweet potato. I find it to be a profitable crop, returning a greater yield than the common potato, and of excellent quality. Warm, sandy soils, or sandy loam, are the locations they delight in. They have never failed of making a good yield, except this present season, which has had a great amount of unseasonable cold and drought.

The potatoes are raised from slips forced in hot beds. This part of their culture requires great care, patience and experience in order to produce healthy plants. Finding that this labor and expense in starting made it a losing business, the plan was adopted of making the beds larger than was required for my own use, and raising the slips for sale; thus recovering a part of the expense. With this arrangement it is a profitable crop for me and for those who purchase the slips. As it is very rare that any of the slips taken from my beds perish, and as they can be readily transported, properly packed, a great distance, a large number of people have availed themselves of the opportunity, at a trifling cost, to furnish their families with this valuable root.

ESSEX.

From the Report of the Committee.

Last year twelve towns or cities of the county were represented in this department by sixty-eight contributors. The present season, sixteen towns, by ninety-eight contributors. The display of vegetables was uncommonly good; that of the squash and of the potato was particularly fine. It was highly gratifying to perceive this latter vegetable in so great a variety and in so healthy a condition. For many years this crop has suffered so much by the rot that the success of its cultivation has been very

precarious. It is considered one of the most valuable vegetables that is grown on the farm, and may many years elapse ere this disease shall commit such fearful ravages among our crops.

A growing interest in exhibitions of this character is very perceptible from year to year. The increased receipts at the door, and the crowded condition of the hall, indicate that the public attention is awakened to their importance. The greater amount of contributions, and that from a larger number of contributors, is an evidence that this branch of culture is not neglected, but is receiving a due degree of attention, especially in our cities and larger towns, or their immediate vicinities.

Such being the case, it is much to be regretted that the society does not furnish more extensive accommodations for a proper display of the products of industry, particularly in that department which is under the immediate charge of this committee.

The specimens for the most part are large—as huge and mammoth squashes, bunches of onions, beets, carrots, turnips, potatoes, &c.—and require much space to exhibit them to advantage.

The society, by issuing a general invitation to all producers, and requesting them to contribute the choice specimens of their products to the exhibition, guarantees a due degree of accommodation for displaying such articles as may be presented. It seems to be only a mere act of justice to these contributors that the committee of arrangements, or those to whom this duty belongs, should see that all suitable measures are adopted to attain this object.

A collection of vegetables, when properly arranged, presents a beautiful spectacle. The diversity of forms is very peculiar, and so striking as to arrest the attention and to excite the admiration of the most indifferent observer. Every part of the plant is here represented in one or the other of the various classes, and to the improvement of that particular part of the plant in the respective class the efforts of the cultivators are mainly directed. Thus some are cultivated for the leaf, others for the leaf stock; some for the ripened seed, others for the pericarp or the receptacle of the seed; some for the bulb or bud, in which is folded the future plant; others for the roots, &c.

In each of these several groupings we likewise observe a great diversity, not only in form, but in size and coloring: thus in the gourd or squash family are presented the small egg squash, of light color, resembling very much a large egg, and weighing only a few ounces, and the mammoth specimens, which weigh some one hundred to one hundred and fifty pounds; some are round, others oval; some are crook-necked, and others are long and slender, not unlike a snake. The tomatoes also differ much, not only in color, but in form and size. The same may be observed in all the other groups, but not perhaps to the same extent as noticed in the above.

The object of these exhibitions is not merely to gratify the eye, and to get up a pretty show to look at and to admire, but to afford an opportunity for all, especially the agricultural portion of the community, to observe what has been accomplished by others, that they may be induced to go and do likewise, so far as it may be expedient.

No one can witness an exhibition of this character without reflecting upon the infinite variety of means which has been furnished by a kind and beneficent Providence to administer to our wants and comforts.

The attention given to this culture is confined principally to a few market gardeners in the immediate vicinity of the larger towns, and to amateurs who devote only a portion of the time which is snatched from other occupations. By this latter class it is considered as an amusement or relaxation from more arduous duties, and at the same time conducive to health.

The farmer does not look with much favor upon this employment. He considers that his attention must be given mainly to the cultivation of what he calls the standard crops, and that his time ought not to be frittered away in looking after a kitchen garden and such trivial pursuits. Little does he consider how much profit he can make; how many luxuries and comforts he may contribute to his family; how much he may improve the grounds about his dwelling—not only to please the eye, but greatly to increase the purse—by devoting a small portion of time and labor in converting the waste, and perhaps worse than useless land about the homestead, long encumbered with scattered logs of wood, old sleds, wagons, and the like, into a garden, where can be grown varieties of vegetables and fruits, also

flowers and shrubbery—if these last should be added, so much the better, as they will contribute much to the charms of the rural home. If at any time the farmer's children should migrate and seek a settlement in other places, the early associations clustering around the place of their birth will be the more endeared, if connected with a rural retreat, sequestered in some shady nook, and surrounded with pleasant gardens, with the honeysuckle and the rose bush entwined around the door-way, and the drooping elm and other ornamental trees scattered along the way-side.

The labor of keeping these grounds in order can be performed at odd moments, and very frequently by those inmates of the household who do not engage in the more arduous duties of the farm.

These hints have been suggested by examining the list of contributors, and ascertaining, as far as circumstances will permit, their respective places of residence; and are presented with a sincere desire that more attention should be given to this branch of culture, not only by the farmers themselves, but by others. Even in our larger towns where so much appears to be done, more can be accomplished that would add much to the productive industry of the county, if the small parcels of ground attached to many dwellings were devoted to fruit or vegetable gardens.

The society has done much for the accomplishment of this object—more yet remains to be done. The work has, as it were, but just commenced; let no effort remain untried to secure so desirable a result.

HENRY WHEATLAND, *Chairman.*

MIDDLESEX.

Report of the Committee.

The committee on vegetables, having attended to the duty assigned them, are highly gratified in being able to state, that the exhibition, in their judgment, surpassed any thing of the kind we have had on former occasions, both as regards the quality and variety of products exhibited.

The display made by Mr. J. B. Moore, of Concord, was re-

markably fine in all its parts; but his Mountain Sweet Water Melons accorded exactly to the taste of your committee, and we guess others are ready to join us in commending them, if the short space of time it took to devour a large one is a criterion by which to judge of their merits.

Other gentlemen, too numerous to particularize in the limited amount of time and space we have to appropriate on this occasion, made fine displays, two of whom we will notice in this connection: Mr. Hager, of West Acton, brought in several large and fine squashes, the product of one seed; S. G. Wheeler, Esq., of Concord, showed as fine beets, carrots, turnips, potatoes, squashes and other vegetables, as any other gentleman, but they were obliged to share the fate of Mr. Hager's squashes, and for the only reason that they were not entered according to the rules of the society. They were an hour behind the time specified for closing entries. At this point, let us suggest to those who intend to contribute to exhibitions of this kind, the importance of being prompt. Promptness should be observed in the discharge of every duty, and on such occasions, tardiness produces confusion. Those who have served on committees will at once concede that their duties are arduous enough, when all the rules of the society are strictly adhered to.

These remarks are made in kindness, and if there are any who feel that their contributions were not properly noticed, we regret it, and assure you we labored diligently, without any feeling of particularity, to do justice to all, and if errors were committed, they were errors of the head and not of the heart.

Asa Clement, *Chairman.*

NORFOLK.

From the Report of the Committee.

The number of exhibitors in this department was thirty-seven. The specimens of vegetables and roots exhibited, made a very respectable appearance and were of superior character. This is true, whether we do or do not consider the severe drought of the season. It is true of potatoes, squashes, pumpkins, beets, carrots, turnips, &c., &c., which formed a very creditable portion of the exhibition.

The committee regret that they had not, at the day of exhibition, and that they have not had since that time, statements of the modes of their culture, or of "the best conducted experiments in raising them." Premiums for the best experiments, in this regard, they consequently are not prepared to award.

The following statements from Messrs. Mann and Colburn, were passed to the committee at the time of the exhibition.

D. KIMBALL, *Chairman.*

Statement of S. C. Mann.

If your attention is called to twelve varieties of potatoes, exhibited by me, I desire to state that they were sent mainly for the purpose of showing the result of light seeding. They were all grown from small potatoes, not large enough for cooking, and were all cut so that not more than two eyes remained on a piece. Two pieces were put in a hill. They were planted about the first of June, in different locations, and where they escaped the effect of the late drought, the crop was good. The crops not being yet gathered in, I only measured the produce of one variety, namely, that kind grown from bits cut from the seed end, taking not over one-eighth part of the potato, and this I often cut in two pieces, the remaining seven-eighths of the potato being used for the table. This gave me one bushel from eighteen hills. It was not an experiment with me this year; I risked this manner of planting from the result of former trials.

I also exhibit a sample of potatoes grown from bits cut from the seed end two months previous to planting,—the principal part of the potato having also been used for the table. The seed in all cases was limed immediately after cutting.

DEDHAM.

Statement of Mr. Colburn.

I have presented a bushel of "Jenny Lind" potatoes. I planted one peck of seed and raised three bushels from thirty-two hills. The bushel is a fair sample of the whole of them. They were raised on low land, on rich, deep soil.

DEDHAM.

DOMESTIC MANUFACTURES.

WORCESTER.

From the Report of the Committee.

The committee on this class of articles regret to say that they have not found their duty a very onerous one. The number of articles exhibited was small, and but little interest is felt in this part of the exhibition. The products of the dairy and the tenants of the pens naturally attracted the attention of the farmers themselves, while the swift-footed steeds upon the turf without have greater attraction for the miscellaneous visitors than the show of rugs and patch-work quilts within the hall. It was the general observation of strangers that the display of the manufactured productions of Worcester county industry was unfortunately meagre. It should be remembered, however, that several years since this department of the exhibition of the agricultural society was transferred to the mechanics' association, whose exhibitions have been of a most interesting character. It is only within a year or two that this society, on taking possession of its new and spacious building, has assigned room for the display of miscellaneous manufactured articles, and placed a limited number of gratuities at the disposal of a committee. As, however, the exhibition of the mechanics' association is held only triennially, it is worth while to consider whether it would not be well to afford greater encouragement for the display of articles of this class at our annual festival. Certainly, the industry of our farmers' wives and daughters should not pass unrecognized. This year they sat with us at the social board, for the first time, and enlivened our somewhat formal feast with their presence. It is no more than generous that we should display a greater interest in the products of their taste and skill.

J. B. D. Cogswell, *Chairman.*

WORCESTER NORTH.

From the Report of the Committee.

The usual difficulty was experienced by your committee this year in examining the articles entered in their department,

many of them not being presented till the morning of exhibition, and these consequently did not receive that careful examination which their excellence really merited.

The variety of articles entered, when compared with the extensive manufacturing industry of Worcester North, was extremely meagre, though equal, perhaps, to that of any former exhibition. The mechanics and manufacturers of Fitchburg and the adjoining towns could make a better show of the products of their industry and skill than any other section of the State, of the same extent, both in respect to variety and excellence of workmanship. The exhibition of mechanical and manufactured articles is always attended with considerable trouble and expense: the primary object of the society was to promote the agricultural interest, chiefly; and though the whole amount of premiums awarded this year is more than double the sum appropriated to this department at any previous exhibition, still it is not sufficient to afford very strong inducements to mechanics of humble means to incur the expense of exhibition. These and other reasons, which need not be specified, have always operated unfavorably upon the show of articles in this department. In view of the importance of our mechanical and manufacturing interests, the suggestion often made that the mechanics and manufacturers of Worcester North should establish a separate association, is worthy of consideration.

By request, the committee examined a new signal for railroad bridges and crossings, one of which is in operation on the Vermont and Massachusetts railroad, the invention of Mr. George L. Whitney, of Fitchburg, and one which cannot fail to do much towards preventing those fatal bridge accidents so common on our railroads. It is a signal to be placed at a distance of eighty or a hundred rods from any bridge, and consists of a bell suspended by a crane directly over the track, some ten feet higher than the top of a car. An iron rod, with an elbow at the top of the crane post, connects the bell with a shaft, running from the foot of the post under the rail; the end of this shaft being flattened into a pedal, raised just enough to be pressed upon by the flange of the car wheel, so that the bell is rung directly over the head of the brakeman, by every wheel passing over the pedal; that is, the bell continues to ring until

the whole train has passed by the signal; a warning that cannot be unheeded of the danger at hand.

It is obvious that this simple but ingenious contrivance can be made equally successful at crossings, where frequently, owing to the direction of the wind, or a short curve, the approach of the train is not discovered in season. To serve this purpose, the bell may be hung over the crossing, and by means of poles, connected by a stout wire or rod with the shaft and pedal above described, so that the bell at the crossing will, by its continued ringing, give warning of the approach of a train to passengers on the highways near the crossings, in season to provide for their safety. Had this invention of Mr. Whitney's been applied to the crossing on the Camden and Amboy road, the late terrible slaughter near Barlington would not have occurred.

Mr. Whitney has made application for a patent, and it is to be hoped that this invention will meet with the attention which it merits from railroad managers.

A neat model of Willis's improved Stump Extractor was exhibited. This machine is manufactured at Orange, and its power in removing stumps has been pretty thoroughly tested in various sections of New England. Acres of stumps in this immediate neighborhood have been taken out by it, and as many of our citizens have witnessed its operation, it is perhaps needless to add our praise of its great power and utility.

JOHN J. PIPER, *Chairman.*

From the Report of the Committee on Bread.

Although there were twenty-one specimens of bread offered for premiums, and premiums were offered for four varieties of bread, there were but three kinds of bread brought forward for examination. There was no bread made from unbolted wheat. A very considerable proportion of the bread was baked on the morning of the day of examination, and some of it was found by the committee to be quite warm. We would suggest that all bread intended for examination for premiums, especially brown bread, should be baked the day previous, in order to be in a fit state for a fair test of its quality. The committee have examined all the specimens of all the various articles submitted

to them, with much care, and have awarded to Miss Mary E. Smith, for the best loaf of wheat bread, the first premium of one dollar, and to Miss C. McCarthy, for the second best, the second premium of fifty cents. To Miss Julia M. Downe, for the best loaf of bolted rye, one dollar. For the best loaf of brown bread, a majority of the committee have directed me to report the first premium, of one dollar, to Miss Sarah Marshall; and to Miss Alice J. Wellington, the second premium of fifty cents. Other samples of brown bread were offered, which, in the opinion of some of the committee, were quite equal to the above.

E. TORREY, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

From the Report of the Committee.

Manufactures, as defined, are all those products of human industry which are the result of a change of form in the raw material, for some useful purpose. The very name *manu-facture* indicates something made by the hand, in distinction from what is the work of nature.

Manufactures may be viewed in their relation to political economy, or the economy of a nation, as they often have been, in our own country, for the last twenty or thirty years. They may also be viewed in their relation to domestic economy, or the economy of households; and it is chiefly in this relation that we who are collected in an agricultural association would naturally be inclined to view them.

Anciently much more was done in families than now, in manufacturing articles of utility and luxury, which were in general use. In the hunter or the shepherd state, the man who makes a bow from an ash tree, or an arrow head from flint, is a manufacturer; the woman who grinds corn between two stones or in a mortar, and bakes it into cakes, is a manufacturer. In the time of Solomon, the good housewife was one "who seeketh wool and flax, and worketh willingly with her hands." "She maketh herself coverings of tapestry; her clothing is silk and purple. She maketh fine linen, and delivereth girdles to the merchants."

In our own country, within the memory of some now living, the spinning wheel, especially the one for flax, often made a part of the outfit when the bride left her father's house to dwell with her husband. A spinner who could annually count a goodly number of skeins of linen and woollen yarn, and a goodly number of sheets and towels bleached by herself, was sure of suitors. The spinning wheel made pleasant music in the house of the married pair; to which, in the way of interlude, were sometimes added in some families the labors of the loom, with alternate notes of the treadle pressed by the foot, and the shuttle thrown by the hand. Nor was the voice wanting, to trill forth some old English ballad, or some Puritan psalm. The "great wheel" gave health and a graceful, ready step to the young maiden. The "little wheel," borne by a brother or by a "neighbor lad," she would of a morning carry to the house of some young friend as light-hearted as herself, to spin in concert during the day. And then in some places annually came the spinning bee—a donation party at the parson's—where the matrons and the maidens carried their run of yarn, and their husbands or lovers some equivalent; and where all "found it good to be merry and wise," cheered on by their courteous and pious host and hostess.

But times have changed. Family employments have changed. The spinning wheel has given place to the cotton mill and the woollen mill. The hand-shuttle has given place to the power-loom. A single machine, tended by a single person, will often do the work of twenty hands. Machinery has changed the manufacturing business of the country, and the family spinner's "occupation is gone." Since the invention of the knitting-loom and the sewing-machine, knitting and sewing in families seem destined to the same fate as spinning. There are, therefore, in many families, those who are like the lilies of the field in beauty, and who, like them, "toil not, neither do they spin." An important question therefore arises: What manufacturing employments can be advantageously attended to in families? The answer to this question must be diverse, inasmuch as the condition of families is diverse.

This question can be viewed, first, in relation to pecuniary profit. An article manufactured by machinery costs half a dollar to make it; manufactured by hand in a family, it costs a dollar

to make it. In such a case you say that it is folly to make it in a family. Are you sure of that? Time is money. If you have not the half dollar in coin, it may be better for you to pay a dollar in time which you have on your hands, rather than go without the article. A woman may advantageously spend a dollar's worth of time in knitting a pair of stockings, when she could buy as good a pair at the store for half a dollar. In the same way a farming utensil can be advantageously manufactured in the family, even though it cost double in time that it would in money, if the maker has the time but not the money.

Moreover, there are certain articles of family consumption that cannot be manufactured by machinery, but must be made by hand. This class of articles, where there are skill and leisure, can always be profitably manufactured in families. Those families that, in the odds and ends of time, manufacture various articles of consumption, are observed to thrive more than those who buy every thing because they can buy cheap.

This question can be viewed, secondly, in its relations to health and enjoyment. Many articles manufactured require active exercise of body and of mind, and are thus favorable to health and happiness. A lady in the city of New York, distinguished for mental cultivation, the wife of a gentleman of great wealth, being out of health, was recommended by a physician to try the effects of spinning wool at the great wheel. Accordingly she had a room fitted up, and kept at the right temperature in the winter time, where she every day exercised in this way, much to her advantage. The feelings are pleasantly employed upon a valuable object, and are in this way kept from preying on the mind, or from being bestowed on trifles.

This question can be viewed, thirdly, in its relations to mental improvement. When a man makes an article for use, he must judge whether it is adapted to the end for which it is made. In this way his judgment is improved. When a woman, for instance, manufactures butter, her faculty of observation is called into requisition, and is thus improved. When a young girl pieces a bed-quilt, her invention is taxed, and is thus improved. When a young lady makes fancy work, her imagination and taste are employed and improved.

Thus, in changing the form of the raw material for some

useful purpose,—pecuniary profit, or health and enjoyment, or mental improvement, may be the prevailing motive.

WILLIAM C. FOWLER, *Chairman.*

HAMPSHIRE.

Report of the Committee on Bread.

According to the best recollection of your committee, the first successful bread-maker of whom we have any account, was Mrs. Abraham; who, on a certain occasion, by the direction of her husband, took "three measures of fine meal," and, after kneading, baked it on the hearth. This was before the invention of brick ovens and cooking stoves; but she might have had one of those old-fashioned tin ovens, which, on the hearth before a brisk fire, performed its work finely. Whether she did or not is a matter of little consequence; but she made bread of the first quality—fit for angels to eat. From the days of that lady to the present time, the art of bread-making has been one of prime importance, and it will always continue so. We sincerely hope the ladies of the present day will, in this respect, follow the example of their "illustrious predecessor," while they are not a whit behind her in the moral virtues. Judging from the exhibition of to-day, there is many a fair bread-maker, who is worthy of being the wife of as worthy a husband as Abraham. Such white loaves as those on which we feasted our eyes and our tastes we have seldom seen. We are convinced that, notwithstanding it is written, "man shall not live by bread alone," yet that he might do so with pleasure and profit. Your committee did not stop to inquire if the hands that made this bread were decked with rings and accustomed to the piano; neither do we care. Only give us the bread first; and, afterwards, things less necessary, *ad infinitum*. This being the opinion of the committee, we say to all mothers, teach your daughters to make bread, and to take pride in making *good* bread, fit for a king's—that is, a farmer's table. Then, and only then, should they aspire to the honor and dignity of presiding at his table. As the bread was all good, we have awarded, in addition to the premiums, to each of our fair bread-makers, A FARMER.

LEVI STOCKBRIDGE, *Chairman.*

CHEMISTRY AND FARMING.

From an Address before the Essex Society.

BY JAMES R. NICHOLS, M. D.

In considering what chemistry has taught the farmer, we must not, in our eagerness to learn the practical benefits of its teachings, overlook that accumulation of beautiful and important facts, which unfolds the philosophy of the origin, the structure, and the growth of plants. In darkness intense as midnight was this kind of knowledge involved, and it was only by the light of those fires in which were buried the crucibles of the chemist, that the dark cloud was pierced and all around and beneath illuminated.

The whole operation and growth of a plant is strictly a chemical problem, and intimate indeed is the connection of the soil cultivator with its germination and growth. He is not the chemist that actually produces the plant. The unseen manipulator, whom we designate the "vital force," is the chemist who does the work, and whose amazing skill exceeds all human capability. His laboratory is no circumscribed one, bounded by partitions of wood and stone, but its area extends farther than the eye can reach, and its enclosing wall is the great rotunda whose span stretches beyond even the imagination of men.

You, gentlemen, stand within this great rotunda, and in the immediate presence of the great Chemist, who calls upon you to aid him in his work. Day by day you witness his marvelous power, in calling from the slumbering earth the tender blade of grass, the beautiful flower, the useful cereal and leguminous plants, the creeping vine and the spreading oak of the forest.

You can promote or you can destroy, the work of the sublime Creator and Architect. You can retard, or facilitate, the

chemical changes which are going on so continuously and vigorously around you and beneath your very feet.

And what are these changes? A knowledge of them teaches the great secret of plant growth. It unfolds to us the philosophy of that fact, incomprehensible to so many, how from the ethereal atmosphere almost alone the solid forms of organized structures are elaborated.

How wonderful is this truth, gentlemen, that a large proportion of the material of the grains, and fruits, and grasses, you have just gathered into your barns and granaries, is composed of the constituents of common air. Perhaps it is even more wonderful, that the solid and inflexible fibres of the oak, the hickory, the beech, and scores of other woods, exceeding even these in density and hardness, are formed from the unstable medium we breathe, and which seems so utterly devoid of materiality and solidity.

Chemistry alone is capable of teaching the farmer the philosophy of that aggregation of atoms, by which plant organisms are developed and increased, until full maturity is attained. It teaches him what office the soil, the rain and the air, subserve in accomplishing the work, and the information it imparts is minute, wonderfully exact and intensely interesting to the student. It teaches him the interesting fact, that his soil originates from the solid rock which constitutes the crust of the earth, and explains the nature of the forces which have produced crumbling and decay in the same. Its teachings are so important in this particular that I will stop a moment to consider them.

If you procure from one of our hills a piece of granite of either of the different varieties, and finely pulverize it and analyze it, you will find it to contain all the constituent elements of which all other rocks consist. Hence, you will be led to conclude that they all originate from the granite, that this is the parent rock of quartz, talc, serpentine, feldspar, mica, &c., from the crumbling of which our soils have been formed. By the decomposition and crumbling of the mica and feldspar in a particular region, one kind of soil is formed; by limestone in other localities, another kind; and hence, it is plain to see that a variety of soils must result from the disintegration of the different kinds of rocks. A very clear conception of the work of

exfoliation may be obtained, by supposing an individual to have been placed upon our planet at a time when it was a hard, impenetrable mass of rock. Suppose him to have lived through all the great epochs of time until the present, and to have witnessed the gradual metamorphosis from barren sterility to the extreme of vegetable luxuriance. Suppose him capable of witnessing the gradual crumbling of the adamantine masses, and the formation of cultivatable soils. If the agencies in past ages were the same as are now at work, he would have seen that every flash of lightning that shot athwart the sky, by decomposing the atmosphere, produced a trace of nitric acid, and that this, falling upon the rock, aided in the work of separation. He would have seen that the carbonic acid of the air, the rapid freezing and thawing, the mechanical effects of rain, the attrition of dust moved by winds, all conspired to reduce the seemingly defiant quartz, and talc, and gneiss, to a finely subdivided powder capable of sustaining vegetable life. The chemistry of these atoms of dust is very easily understood. God, in the beginning, made use of about sixty different kinds of materials in constructing our planet, and he selected ten or twelve only of them, from which to form all kinds of rocks. It follows that the dust atoms must be made up of the same material as the parent rock. From them the mineral food of plants is obtained. The inorganic, or mineral food, which plants require, are principally silica, lime, magnesia, sulphur, potash and soda. Their presence in the soil is indispensable, as without them no plant growth could begin and continue. A plant has as capricious an appetite for its mineral food as a human being has for its food, and each variety calls for its appropriate nutriment, and if nature does not supply it sufficiently in the soil, or if you, gentlemen, do not step in and furnish it, it famishes and dies. There is as much propriety in saying, when we observe a stock of corn struggling for existence in an impoverished soil, that it is starving to death, as there is in saying that an animal famishes, when food is withheld. Let us observe still further the striking analogy between plant life and animal life. I have said that both have their appropriate, chosen food. If we place before a favorite horse or ox such forms of food as man requires, and withhold hay and grain, their appropriate food, they will ultimately perish. Thus it is with vegetables. If you

plant pease or beans upon a field where there is no trace of lime in the soil, although it may be rich in potash and phosphoric acid, upon which other plants would live and thrive, they will as certainly famish as though you sowed them in the granite quarries of Quincy, or among the glaciers of the Alps. To attempt to feed the different varieties of plants upon the dust atoms of a single kind of rock, would be as absurd as to gather the different races of men together, and endeavor to sustain them upon the watery fruits of the tropics. While the seething negro would satiate his appetite, and grow lusty, upon the water-melon and the banana, the greasy Esquimaux would cry aloud for his train oil and blubber, and if it was withheld, he would probably die from the cravings of unappeased hunger. A plant is like an infant, as respects the preparation of its food. It has no teeth to masticate, no salivary glands to pour out diluting fluids, to render digestible its rocky aliment, and yet it can receive it only in a liquid, soluble form. Its mouths are microscopic, and nothing not minutely subdivided can pass their portals.

You, gentlemen, are men nurses, laboring among your plant children, pulverizing and moistening their food, (unless the clouds aid you sufficiently with their misty treasures,) even as the female nurse within the precincts of the children's nursery is busily employed in preparing and rendering easily digestible that which the appetite of her little troop so urgently demands.

Nature does much by the activity of those forces already alluded to, to prepare the inorganic food of vegetables. Although the rocks have crumbled into powder of varied fineness, and the mass of this powder constitutes the soil, yet the largest portion of it is still very far from being fine enough to be appropriated by plants. Minute atoms of granite, of limestone and feldspar, scarcely perceptible without the aid of the microscope, pervade every soil, and must be further acted upon by carbonic acid from the air, by rain, by mechanical forces, &c., before it is of any use to your maize plants, your tubers, your grains and vines.

It will be understood then, that you may possess land, rich, perhaps, in the mineral substance which a peculiar grain requires, and yet after successive crops it may languish and fail, for the want of a substance already in the soil, but which is not

in a condition to be used by the grain. And here we see the connection of chemistry with the business of the farmer in the tillage of his lands. He plies vigorously the plough, the hoe and the cultivator; he digs, he pulverizes, he reverses the condition of the soil, bringing up to the surface that which is buried, and burying that which is upon the surface; and does he suppose that the vigor he thereby imparts to the soil and plants is derivative solely from the mechanical effects of his labors? There are great benefits thus produced which are very far from being mechanical. It is indeed beneficial to loosen the soil so as to prevent binding, and to aid in the percolation of water through the same; but some of the greatest benefits of active tillage are strictly chemical in their nature. By stirring the soil, atmospheric air is let into it, and the carbonic acid it contains fixes its corrosive teeth into those minute grains of rock, and rends them asunder. They are thus so changed, that instead of being rejected by the hungry plants, they are seized with avidity and consumed. And further, by tillage there are chemical effects produced in that part of the soil not mineral or inorganic, by which decay, or putrefactive change is carried forward and plant food produced in large quantities. Thus chemistry conclusively shows that by mechanical labor alone upon soil, that nutriment is afforded which is equivalent to the application of manure, and hence, with these distinctly in mind, no farmer need be surprised at the energy with which his crops shoot forward, after the application of the hoe and cultivator.

It was chemistry which taught the husbandman the importance of subsoil ploughing. There are many farmers who are unable, as yet, to overcome their prejudices sufficiently to try the experiment of deep ploughing upon their lands. They erroneously suppose that the whole virtue of their lands, lies in the black mould or humus upon the surface, and if they go below that, and bring up sand, and yellow or pale earth, and mingle with it, of course it must dilute and impair its fertility. They certainly know that their soils are superficial and weak enough already, without going down to bring up that which cannot sustain, as they suppose, a blade of grass. They reason thus because chemistry has not taught them its important lessons. They are not aware that that which lies deep below the

mould came from the rocks, and is rich oftentimes in their mineral constituents. It only needs to be brought up to the surface, so that the air and rain can reach it, to promote chemical decomposition and fit it for important plant aliment.

I doubt not that oftentimes a farmer has applied gypsum to his land suffering from the want of lime, when he might have obtained all that was necessary by subsoil ploughing and active tillage.

Chemistry teaches that plants do not obtain all the elements of their growth from the mingled rock dust and humus constituting the soil. The atmosphere comes in for a share in rearing the structure, and the aid it renders is voluntary, and entirely independent of help from the husbandman. He cannot promote his interests and increase his crops, by endeavors to influence atmospheric action upon his plants. It is only through the soil that he is able to do this. Plants derive their carbon, or charcoal, chiefly from the air. The great bulk of all plants is charcoal, and consequently we see how important is the aid derived from that source.

How many of you, gentlemen, call to mind the fact, as you sit around your comfortable hearth-stones in the long evenings of winter, and witness the gradual transmutation of the blazing pile of wood into black lustrous charcoal, and then, by further combustion, apparently into a heap of ashes? How many remember that there is in the one a constituent of the very winds from which you are so effectually sheltered, and in the other a portion of the soil abstracted from your fields? I am perplexed to understand how a farmer can witness these wonderful changes every day of his life, and not have sufficient curiosity awakened to lead him to interrogate that beautiful science, which is competent to answer his every question and satisfy his thirst for information.

The facts as stated are of themselves paradoxical and difficult of apprehension. There is no charcoal in the earth, none in the air, and yet, if we allow fire to act upon a bit of the whitest wood, a portion of wheat, or corn, or an apple, or starch, or sugar, it is always produced. Does fire produce it, manufacture it? or does it simply develop what was positively in their substance before? Chemistry affords an answer to the question. Suppose a good housewife places in her heated oven an apple,

(a potato, a loaf of bread, or any vegetable substance will answer the same purpose,) and then, amid the multiplicity of household cares, it is forgotten, and when examined is found done, not *brown*, but *black*. The oven has inadvertently acted the part of a charcoal manufactory. The apple has disappeared and in its place is found a dark and crispy shell. In the growth of the apple it took from the earth its gaseous elements, its hydrogen, its oxygen, and also its mineral rock food. From the air principally it procured its carbon, in the form of carbonic acid, which is a gaseous acid composed of one atom of carbon united to two of oxygen. Thus united to oxygen, it exists in the air, and although itself always intensely black, except when in a crystallized state, its color is not detected by the eye. We may perhaps be led to conclude that the apple, in common with all other vegetable substances, is ashamed of the color of its carbon ingredient, for before it can appropriate it to itself, it must first expel its two oxygen attendants, and thus expose its hue; but it instantly so blends and combines it with the other elements that we are unable to see it until that merciless disorganizer, heat, drives off again its more fickle and volatile companions, and then the sable element is seen in all its nakedness. The undue heat of the oven has done this. While the oxygen, hydrogen and nitrogen ingloriously fled, as the flame curled around the iron dome, black carbon remained faithful to his post. But let us try his courage a little further; let us see what curious results will follow if we apply flame to the crispy mass. Ah, now we see changes and new combinations, to which perhaps the field of politics alone is capable of affording a parallel. One of the substances, oxygen, which fled so precipitately from the oven, now seems to repent of its inconsistency, and as the flame grows more intense, it rushes in to the very centre of the conflict, not singly, atom by atom, but in pairs, two individual atoms together, clasping one of the carbon, and thus the sable bride, again married, not to one oxygen bridegroom, but to two, floats off upon its bridal tour through the air. But such unnatural unions must always prove sour, and of short duration—such is the result here. The united parties are acid from the start. Thus combined they constitute, in fact, carbonic acid, and the unhappy union continues until some beautiful plant, or flower may be, in seeming pity for the par-

ties, seizes them in its tiny embrace, and with one strong effort effects their separation, sending the disunited atoms of oxygen away into space, and appropriating the carbon to itself, to aid in its extension and growth. When the charcoal is burnt away there remains a small quantity of ashes, the mineral food of the apple derived from the earth. I venture to adopt this method to illustrate some of the marvellous changes incident to the growth and destruction of all vegetable organism. Chemistry has taught us fully respecting these transmutations and the whole philosophy of plant growth; but I must pass to consider further the practical and useful information which it has afforded the agriculturist. By the accurate and wonderful process of analysis of vegetable structures and soils, it has at once pointed out the true course for the farmer to pursue in order to attain the highest success in his vocation. It first pointed out the materials he needed, and then new sources of supply for the same. It has taught the farmer economy in the preservation of his fertilizers; it has informed him how to apply them to the soil to the best advantage.

Guided by its teaching, there is not, there cannot be, any more uncertainty as it respects results, provided those meteorological agencies which are beyond the control of man are favorable, than in the prosecution of any mechanical branch of industry. Unfavorable seasons, as it respects drought, blight, &c., may be even rendered more favorable by systematic, scientific husbandry. Without its aid all is involved in doubt and uncertainty. The successful farmer is unable to explain the reasons of his success; the unsuccessful one is ignorant of the causes of his failure. How can any one of you, gentlemen, be certain that you are correct in applying any single kind of manure to a soil, without you first know whether there is a deficiency of that ingredient in the same? If you learn from the result of crops that there is a want of some kind, how can you be sure to meet it without applying all varieties of manure? In doing this you would certainly be acting on a level with the famous herb doctor, who, ignorant of the nature of disease, and ignorant of the medicinal virtues of the various roots and herbs he prescribed, came to the conclusion that to hit his cases positively, his only course was to steep a mass of all kinds together, and pour the decoction down the throats of his patients.

Supposing you are desirous of raising a clover crop upon a piece of land for several consecutive years. You begin. The first year you obtain an abundant crop, the next it is sensibly diminished, the next, perhaps, it is almost an utter failure. You dress the land abundantly with animal manure; that aids somewhat, but still your crops rapidly decline, and you come to the conclusion that clover is an amazingly exhausting crop. You think it almost equals the tobacco plant in plundering the soil. Clover is now abandoned, and, with but little confidence in results, you sow rye upon the field. Harvest time has come, and what a yield! It exceeds all former precedent. You are puzzled; you are perplexed. You cannot explain how such worn-out land, which could not grow a hundred heads of clover, should fill your rye-bins to overflowing. Chemistry would here have taught a useful lesson. The first two or three crops of clover exhausted the lime in your soil, and you did not supply it, as you might have done with a few bushels of plaster or gypsum, which is a sulphate of lime. The manure which you so continuously applied contained too little of this substance to aid materially. Your clover starved in its earliest infancy for want of its proper kind of food. Rye requires but the least trace of lime, and feeling the full influence of your dressings, produced copiously. This is the explanation which an analysis of the soil, and the clover and the rye, would have promptly afforded. A few months since I was examining a piece of pasture land on a neighboring farm, a portion of which was covered with a magnificent crop of white clover, produced by a dressing of gypsum. The patch was like an oasis in a desert. It blossomed there in honeyed sweetness, while around the earth was parched and sterile. An examination of that soil showed almost an entire absence of lime and sulphur, and every blade of grass was in the last stages of starvation for the want of them. There are but few pastures in Essex which have been long cropped, which gypseous dressings will not benefit. The lime the soil originally contained at the surface has been carried off in the bones and excrement of the animals feeding so long upon the grasses of the same. Our soils, being formed in a great measure from the prevailing quartose granite, abound in silica; but lime is an ingredient more sparsely disseminated through them than is beneficial for many important crops. Hence, we may regard

plaster as a most important and economical fertilizer for a majority of the farmers of Essex.

Chemistry teaches us how rich in plant nutriment is the liquid excrement of animals. It teaches that a farmer may as well let hordes of hungry vermin into his granary to run away with his corn and wheat, as to let the liquid manures of his barns and stables run to waste. A pound of the liquid excrement of a cow will form in the field as much in weight of the stalks and leaves of plants as three pounds of the solid. A cow will produce about seventeen thousand pounds of solid, and about seven thousand of the liquid, in a year; hence it will be seen that the aggregate value of the liquid is equal, to say the least, to the other. Now what farmer would rest easy a single hour, if he was aware that the solid manure of his animals was being wasted? And yet, gentlemen, how many of you have made provision to save that which is as easily saved, and which is worth as much? Let me describe to you a method of preserving liquid manures, which occurred to me while on the prairie lands of the west the past spring. It has the merit of cheapness and effectiveness, and may be generally adopted. I observed, connected with the rough cheap dwellings upon the prairies, a cistern for holding rain water, made by simply scooping out the earth to the depth of perhaps eight or ten feet, and then plastering it over one inch in thickness with a mortar made with hydraulic cement and coarse sand, equal parts. This was allowed to harden, and then covered with plank below the limit of frost. Thus for five dollars a cistern of twenty hogsheads' capacity may be made, which, if carefully constructed, will continue intact for many years. Let each farmer prepare such a cistern as this contiguous to his barn, and let him incline the flooring of his cattle stalls, and attach conductors, so that during the winter all liquid excrement may flow into the same. Let him purchase a carboy of sulphuric acid, which will cost but two or three dollars, and occasionally throw into the cistern a quantity mingled with an equal amount of water, and he will find ready in the spring a manure worth tenfold more than its cost. The use of the acid will be to fix the ammonia which will be formed in the liquid, and prevent its loss by volatilization.

In the construction of the cistern the aid of masons need not, necessarily, be called in. The farmer of ordinary skill can con-

struct it himself. The excavation may first be made, then the mortar prepared by mingling with the cement enough water to form a tolerably liquid paste, then working up with it an equal quantity of coarse sand. It may be applied to the interior of the cavity by the use of the hoe and the shovel. In the centre of the plank covering, a box, at least one foot square, should be inserted, to which a tight cover may be fitted, to serve as an opening into the cistern. In cold, frosty weather in winter the liquid of the cattle stalls will be congealed. In this state it will not pass through conductors, but may be taken up with the shovel and thrown into the cistern through the opening. In arranging the cistern the farmer must not omit to place it so that all the drainings of the barnyard will flow into it. This can be done on the premises of most farmers. It is of the utmost importance to his prosperity that not one drop of the rich dark liquid which pervades his barnyard, especially in the spring, should be lost. Even if it does not escape by some outlet, by standing exposed to the air, the ammonia which is formed is lost by escaping into the same, and thus he is robbed of his treasure.

The yard should always have a slight depression in the centre, so that all the drainings will gravitate towards that point; then, by a proper pathway, they may be conducted into the cistern.

The farmer should always have at hand a vessel of oil of vitriol, or sulphuric acid. He will need it, not only for his drainings, but for compost and for dissolving bones. It is purchased in strong, well-protected glass carboys, holding several gallons. Its cost is trifling, not more than two or three cents per pound. It should be kept in an outhouse, and handled with care, and when wanted for use, diluted with at least an equal measure of water in a strong wooden bucket.

It is difficult to state exactly how much or how often it should be added to the drainings in the cistern. We may form an approximate estimate, however, which will perhaps afford sufficiently accurate guidance in this particular.

A half-pint of acid is fully sufficient for one hundred pounds of the urine of a cow. Suppose then each one to produce this amount weekly, and you have in your stalls twelve in number, you will be required to add, each week, three quarts of acid.

A less amount than this will probably suffice, (as losses are considerable,) unless the drainings of the barnyard are mingled with the urine. Of course the contents should be agitated by a proper wooden instrument thrust into the opening of the cistern when the acid is added.

I have dwelt somewhat at length upon the subject of the preservation of drainings and liquid manures, because chemistry teaches me their superlative importance, and because I am convinced that every farmer in Essex county can secure them if he will. How absurd it is for you, gentlemen, to spend your money for guano, when from the drainings of each one of your oxen or cows there may be produced each year fully five hundred weight of solid extract, which in fertilizing power is fully equal to Peruvian guano.

In addition to the large amount of ammonia contained in it, there would be fully six per cent. of potash, one of the most important fertilizers we possess. How much chemistry may aid the farmer in the formation of compost! It teaches him that several objects are to be accomplished in the furnishing and blending together the ingredients of the heap. It informs him what is necessary to produce that series of complex decompositions and recompositions which ultimate in the production of the most eminent plant-fertilizers. No sensible, enlightened farmer will fail to form from year to year his heap of compost. When properly arranged, it is to him a mine of wealth; when formed in a hap-hazard, unskilful manner, it is oftentimes a partial or a complete failure. The cold, sour humus of swamp lands is sometimes brought from a distance and thrown into heaps, and with the addition, perhaps, of a portion of spoilt hay, or decayed leaves or fruits, is called compost, and applied to the soil. Of course it fails almost entirely of beneficial results. The formation of such compost is like a mixture made by adding together water, snow and ice. It is easy to see that no very extensive combination of different ingredients is effected by such manipulations. Chemistry is capable of pointing out a wide difference between the swampy material to which I have alluded and common pond mud, as respects its fertilizing effects. The one is rich in carbonic acid, which can be of no essential importance to most lands, as they

contain it in sufficient quantities, while the other seldom fails to be rich in the calcareous elements so important to soils.

I doubt not but the experience of the husbandmen whom I address will bear corroborative testimony to the facts which chemistry teaches, as it respects the value of black swampy mud when applied to soils. During the extreme drought of the season of 1854 much of this material was removed from swampy land and spread upon soils, with the expectation that it possessed some valuable fertilizing properties. It was seldom that disappointment did not attend its application. It is in most cases nothing but a mass of vegetable humus, leached to the last degree of exhaustion by the action of water, and abounds in no essential ingredient except it be carbonic acid, capable of aiding in plant growth. It may be of some value upon worn-out ridges, or upon a silicious plain, but upon the ordinary tillage land in our section it is of but little value. Generally speaking, it is not the best material for the basis of compost. Those small ponds which abound in animalcules, and which receive the washings of contiguous surrounding hills, afford a better loam when partially dried up.

It is of the first importance that a proper selection of soil should be made upon which to apply fertilizers of this description. A mass of dry sand thrown upon a spongy, damp meadow, will, by supplying silex and other mineral food, and by absorbing moisture, cause it to produce the finest grasses of the uplands. No farmer would think of applying it to sandy soils; and it follows that it would be equally as improper to apply meadow muck to soils of a moist clayey variety. Where chemistry affords no positive knowledge to the farmer, much judgment is needed in distributing manures upon different soils.

In the manufacture of compost, it is impossible to proceed with much success without this knowledge, as in this work it is not the sole object to make a simple mechanical mixture of different kinds of fertilizers, but to combine them, so that chemical change will ensue, presenting barriers to the escape of valuable volatile elements, and forming new compounds by the action. If you develop ammonia, you must have an acid present to combine with and fix it, in the form of a salt, else it is lost by its extreme volatility, as has been illustrated. In making com-

post, a grand object is accomplished when such materials are added as will, by chemical change, produce ammonia. For this purpose such substances must be procured as contain nitrogen.

Decayed flesh, horn shavings, and glue, contain nitrogen, but no ammonia. Now, if you add them to the compost, chemical transformation speedily begins, the nitrogen is set free and goes over to the hydrogen, which is always at hand, and ammonia is formed. If this change did not take place either in the compost heap or in the earth after applying it to the soil, they would have no more effect upon crops than bits of lead or iron. The stalk and seeds of plants require nitrogen. To obtain it, substances in which it is an ingredient must first pass through two chemical changes. They must first be decomposed and ammonia formed; then the ammonia itself must be decomposed, and thus, through this circuitous path, the plant secures its nitrogen. Substances containing nitric acid are proper ingredients for compost, such as saltpetre, nitrate of soda, rubbish of old clay walls, earth taken from under old buildings, &c. Substances rich in carbon are easily procured, such as straw, foliage, litter, weeds, turf, charcoal dust, &c. To form the seed of grain, substances containing phosphoric acid must not be omitted,—burnt bones, wood ashes, animal excrement, oil cake, stable manure, &c.

It would be easy to give recipes; but they are in most cases very unsafe sources of information. The farmer does not want recipes; he must understand principles, and then his guidance will be of that kind which will seldom lead him astray. Some farmers have complained that in their experiments with guano, its application produced the most luxuriant leaves and stalks, but did but little to produce grain. Chemistry teaches that guano is what may be called a quickly-forcing manure, being so rich in ammonia that it at once affords a copious supply of nitrogen to the plant, and thus aids prodigiously at the outset in its growth, but is deficient in that which produces some kinds of grain. If the ground does not contain that principle, the application of this manure may aid you but little in producing seed.

Suppose you sow wheat upon a field which contains none of the phosphates. You apply guano of a variety which does not

contain the requisite quantity. The stalk of your wheat may be prodigious; but to form the grain it calls upon the soil and the guano for the phosphates—they are not afforded, and the grain fails. How many instances are there in the experience of the farmer when the produce of the seed is sadly disproportioned to the yield of stalk,—a result he is fully unable to explain. Your soil and manure being thus deficient in phosphate of lime, in what direction will you look for that agent which will promptly restore to your plants their seed-bearing capabilities?

The talismanic power lies in those bones which lie bleaching and useless around your dwellings. Gather them up; there is gold locked up in those silvery, shining grains which constitutes their mass. They are useless encumbrances where they are, and they only need the most simple manipulation to induce them to disgorge their hidden treasures. Every farmer is capable of collecting bones enough during each year to afford him more than one hundred pounds of plant food, of as much value as the richest guano. Next to ammonia, phosphoric acid, in combination with lime, is the most valuable constituent of manure.

The bones, in order to fit them for application to the soil, should be dissolved in sulphuric acid. For this purpose a cheap wooden tank, or an excavation in the ground plastered with cement, may be provided. The bones must be thrown in, and the acid diluted with four parts of water turned upon them, so that all the bones will be subjected to the action. When dissolution is effected, the resultant powder or paste should be blended with the compost heap in proper proportions. It will constitute one of its most important ingredients, and will aid most wonderfully, in conjunction with ammonia, in the production of heavy crops of grain, and also root crops, such as turnips, carrots, beets, &c.

I have said enough, I trust, to accomplish my object, which has been to show the husbandman how intimately connected is chemistry with his vocation; how much he has learned from it, and how much it is able to teach him. Aside from the pecuniary value of its teachings to the farmer, how delightful is the study of that science which explains to him the phenomena of the expanding leaf, the increase of vegetable fibre, the growth

of grains and fruits, and which also explains to him the nature of those oxydizing forces which are now, on this autumnal day, so busily at work, to scorch and crumble them to powder. There is time in the occupations of almost all for study and improvement, if they will but avail themselves of it. The avocation of the husbandman is very far from affording an exception to this statement. It is with him as it is with every other person in the community; he must improve his leisure hours, he must be diligent and studious; the car of knowledge and progress is rapidly passing, and if he does not leap upon its platform he is left behind.

It does not wait for the indolent or the prejudiced. It is like the great source of solar light; it moves up from its eastern bed in the early dawn, and does not tarry by the way, though a universe of sluggards should slumber on until high noon.

THE CONDITION OF AGRICULTURE.

From an Address before the Middlesex North Society.

BY HON. TAPPAN WENTWORTH.

A reference to some statistics of European agriculture, for comparison with our own, will enable us the better to understand the condition of husbandry in this country, and the necessity as well as the obvious means of its improvement. Those of Great Britain, to whose wealth the increased production of her land has so largely contributed, are the most accessible and the most valuable. An examination of these statistics will also show us that whilst, from obvious causes, we are greatly behind England in agricultural productions, we are still far in advance of many of our sister States; and the recital will add to the proofs already multiplied of the effect of necessity, capital and science upon this important branch of human industry.

A late classification of the lands of three of the important nations of Europe,—Great Britain, France and Austria,—makes one-fifth of the surface in each to be heath, marsh, common and unproductive. But the superior density of population in Great Britain has brought 75 per cent. of her land into cultivation, while France has but 63 per cent. and Austria but 53. Great Britain has in forest one-twentieth of its surface; France has more than one-sixth, and Austria more than one-fourth.

England has been induced to convert her marshes and forests into pasture in consequence of the high price of butcher's meat, wool and hides, and her immense coal fields have enabled her to do this with entire safety to the wants of her population.

It is difficult and perhaps impossible to ascertain the exact quantity of soil under cultivation in the three countries. One

estimation that should be reliable appropriates to Austria 135,000,000 of acres, and to France 95,000,000, whilst that of Great Britain is set down at about 47,000,000. And the agricultural production of the latter is estimated at 133 per cent. per acre more than that of Austria, and seventy per cent. more than that of France. This astonishing result in favor of English agriculture becomes the more significant when we learn that of the population of England not quite 26 per cent. is engaged in agriculture, whilst the population in France and Austria so employed will exceed 50 per cent. The average yield of wheat per acre in England is estimated at from 27 to 32 bushels, and in France at 16 bushels. The agricultural crop of England for 1850 is estimated at £403,187,226, which would be nearly $2,000,000,000, and would give an average product per acre of about forty-two dollars.

In the United States the amount of improved land, according to the census of 1850, was about 113,032,614 acres. The estimated produce was $1,326,691,326, being an average yield of $12.62 and a fraction per acre. The average growth of wheat produced was nearly 11 bushels; that of Indian corn exceeded 25 bushels; that of rye fell below 14 bushels, and of oats about 22 bushels. A comparison of the green crops of the two countries would exhibit in a more favorable light the condition of British agriculture. The growth of population in that kingdom treads so closely on the heels of production that an increased effort has been forced upon it, and a slight attention will show how successful has been that effort. At the beginning of the present century the land in cultivation was computed at 42,881,800 acres, and the population at 16,338,102; the proportion of cultivated land was 260 acres for each 100 inhabitants. The addition since made to the cultivated land and to the population has been 4,129,777 acres, and 12,669,107 inhabitants, "so that for every 100 individuals added to the population only 32 acres have been brought into cultivation, being about one rood and a quarter for each person. If the whole breadth of land now in cultivation was divided equally among the population, one acre and two-thirds of an acre would fall to the lot of each person. It thus appears that 10,000 acres of arable and pasture land, which, as cultivated in 1801, supported 3810 inhabitants, do at the present day sup-

port 5,997." And notwithstanding this vast increase of production, it is now said that in Wales the land does not yield one-half it is capable of producing, and that if all England was as well cultivated as Northumberland and Lincoln, it would grow more than double the quantity that is now produced.

The present condition of her agriculture is decidedly in advance of any State in Europe, unless Belgium and some portion of Upper Italy be exceptions. Her immense productions are obtained from an area of less than 123,000 square miles; an extent of territory which is exceeded by that of Virginia and Missouri combined, and she supports her immense population of 27,619,866, being about 225 to a square mile, with the productions of her own soil, aided by an importation whose greatest annual average for ten years, including the year 1849, was only 2,588,706 quarters, being at the rate of three pecks for each individual; whilst for the decades ending in 1820 and 1830, the importation was but one-fourth of that quantity. It is worthy of remark that, whilst during the thirty years preceding 1841, the centesimal proportion of families engaged in agriculture in England was thirty-five and a fraction, it has now fallen below twenty-six, showing that the quantity of food for the production of which seven families were formerly employed is now produced by five families. From 1801 to 1810 the wheat raised in Great Britain is computed to have sufficed for 11,168,779 of her inhabitants. From 1841 to 1849 the home-grown wheat has supplied 17,004,118 persons.

The causes of this great increase of agricultural production in the British Empire deserve the careful study of every person interested in husbandry. The facts are beyond dispute. The results are seen in the increased wealth of the nation, and in the generally improved condition of her population. And the importance of the question forces itself upon every mind interested in the prosperity of the human race.

The English writers attribute much of this advancement to the large holdings of land in the hands of rich men, and the consequent employment of a large capital in the radical improvements which have been made in reclaiming and draining marshes and waste lands,—to the scientific analysis of her soils, to the application of portable manures, and to

the improvements which have been made in agricultural implements. And they point to France, whose small holdings and comparatively depressed state of husbandry is in strong contrast with that of England. But the first cause assigned may well be challenged. It is contrary to our experience, that any business of importance is so well performed by a tenant or agent, as by a principal whose interest would lead him to improve the condition of his estate, as well as to produce the largest annual crops, and whose daily attention to his growing crops would be a guarantee for good tillage certainly equal to the stipulations of a lease. Belgium may be referred to as affording a satisfactory illustration of the benefit of a minute subdivision of land. The whole kingdom is divided into nearly 600,000 patches, of which forty-three per cent. do not exceed one acre and a quarter each; twelve per cent. do not exceed two acres and a half, and not more than eight per cent. exceed twenty-five acres. But it is unnecessary to go out of England to prove that a higher state of cultivation may be expected from small holdings than has yet been exhibited upon large ones. The evidence furnished by Mr. Coleman, of husbandry in England, under an allotment system of a few acres, (in no case exceeding seven to an individual,) fully demonstrates the superiority of small holdings over large ones, for successful cultivation. That a judicious outlay of capital in agriculture would result in its advancement is undoubtedly true. That it is one of the causes of the farming prosperity of that kingdom is manifest from the very improved condition of the fens, marshes and other lands, which were long considered waste, and now reclaimed, are yielding crops which bear a comparison with those of the best lands in England. That a particular examination of the constituents of soils, and the attention given to needful manures, and further, that the great improvements in agricultural implements and machines have contributed much to advance agricultural production in the British Empire, is also true. But it is not to these causes alone that the favorable state of her husbandry is due.

The change from the old system of fallowing,—the strict regard had to the rotation of crops,—the introduction and successful prosecution of the turnip culture,—the increased attention to the breeding of cattle,—and more than all, the raising

of sheep for a supply of food, as well as of clothing, have imparted to the lands of England a fertility which could not otherwise have been obtained consistently with the general prosperity of the nation. I say consistently with the general prosperity of the nation, for no people can make agriculture a profitable pursuit, unless nearly all the manure used upon the land is obtained from the crops growing thereon, and this with little or no charge for transportation. And it is still more evident that manure cannot be purchased by the crops, unless the latter be sold at consumption prices. The raising of such large numbers of cattle and sheep in the British Islands enables her husbandmen to manufacture manure upon their farms in the cheapest possible manner; and this applied under the light which the present state of agricultural science and experience affords, gives to the lands of the kingdom a fertility of which perhaps no other nation can boast.

There is nothing peculiar to the climate of Great Britain, nor to the crops she cultivates, which should swell her products so much above those of our own soil. There is nothing in her mode of agriculture which we cannot imitate and adopt. Her necessities for production we do not feel as a nation. Land is here so easy of attainment that it has been thought more profitable in some parts of the country to wear it out by cropping and then abandon it, than to follow a regular system of husbandry with a view of preserving in the soil its ordinary fertility. But it is to be hoped that the evil of such a course has been fully developed, and that in the older States, where the weight of a dense population is beginning to be felt, the necessity of an increased agricultural production will achieve for us what the same cause has accomplished for the older nations of Europe.

But there are still among us some who maintain that farming is unprofitable in Massachusetts; that, however inviting may be her position and advantages for commerce and manufactures, the tillers of her soil cannot compete with the inhabitants of the more fruitful West, and that it is bad economy to prosecute farming under the drawbacks of a frigid clime and sterile soil.

The statistics of the last census form the best answer to this complaint, and the averages of the leading crops will show that,

not only may farming be advantageously pursued in Massachusetts, but that in point of production she is far above the average of her sister States.

The average crop of Indian corn per acre in the Union, for 1850, was twenty-five bushels. The highest average in any State was forty bushels,—Connecticut. The average in Massachusetts was thirty-one bushels. The average crop in eighteen of the States was below that of Massachusetts.

Of wheat, the average in the Union was about eleven bushels per acre. The average in Massachusetts was sixteen bushels per acre, and exceeded that of any other State. Sixteen of the States had an average below twelve bushels, and eight of them below ten bushels.

Of rye, Massachusetts raises a fraction less than the general average per acre,—ten of the States exceeding her in the cultivation of that staple.

Of oats, five of the States exceed the average in Massachusetts, and seventeen are below it.

Of potatoes, four States exceed the average in Massachusetts, and twenty-two are below it.

It will be difficult to find in this comparison the evidence that farming is unprofitable in Massachusetts; and if we look at the general average value of many of the crops per acre, it will appear that in the value of the crops grown per acre, Massachusetts stands as favorably as she does in the quantity produced.

The average value of an acre of corn in the United States in 1850, taking the census report as a guide, was nearly $9.55. The average value of an acre of hay was $7.45. Of an acre of wheat, $9.13½. Of an acre of oats, $5.86⅓. Of an acre of rye, $6.50. Of an acre of orchard products, $15.44. Of an acre of potatoes, $26.32. Of an acre of garden vegetables, $10.50.

The census report does not furnish the means of ascertaining the average value per acre of the crops in Massachusetts. Nor does the agricultural transactions of the State, previous to 1853, afford suitable data upon which the value of those offered for premiums may be calculated. But from our general knowledge of values attaching to the grains raised for consumption, it will be readily seen that the amounts above stated were less

than the values per acre of the same crops in Massachusetts for the year 1850.

The Reports of 1853 and 1854, where the value of the crops, the cost of raising the same, and the net profit thereon, as well as the quantities, are in many instances given, will show what the value of the leading crops may be in Massachusetts, when her agriculture has been brought to what is proved to be an attainable standard. The condition of the returns does not allow of all the crops offered being taken into account in forming an average; for the cost of raising and other details do not invariably enter into the statement of the grower, or that of the examining committee, and the average expense of growing the crop, and the net profit of the same, are not made upon all the returns taken, to form the average of quantities.

So far, however, as the details were intelligible they have been used, and the result is, that of thirty-five crops of Indian corn offered for premium, the average yield was ninety-three bushels per acre, and the average profit, $51.11. The largest crop was one hundred and thirty-eight and one-half bushels. Nineteen exceeded one hundred bushels and two fell below seventy bushels.

Of thirteen crops of wheat, the average yield was twenty-five and one-half bushels per acre, and the average profit, $33.04. The largest crop was forty-two bushels. The smallest, fifteen.

Of thirteen crops of rye, the average yield was thirty-four bushels per acre, and the profit, $29.75. The largest crop was forty-seven bushels. The smallest, twenty-five.

The average crop of oats, in 1854, was sixty-one and seven-eighths bushels, of which the average profit per acre was $33.18.

Of potatoes, for the same year, the average yield was one hundred and sixty bushels per acre. The average value was $71.50, and the average net profit, $41.40.

It appears by the census report, that the crop of Indian corn in 1850 nearly trebled that of any other agricultural product, and slightly exceeded the three great staples of wheat, cotton and hay. This fact shows its importance and value, as a feeding crop, to the Union generally. The average value of this crop, in Massachusetts, for the years 1853 and 1854, offered for premiums, was about $93 per acre, which is more than treble the value of any crop in the United States for the year 1850,

excepting tobacco, which is stated at $34.95, and almost five times the average of the cotton crop for that year, which is set down at $19.73.

Taking, then, the crops of Indian corn, wheat and rye, as raised and offered for premiums in the last two years, and whether the aggregate value or the net profit be regarded, making every allowance for the extra labor bestowed upon them and all due allowance for the difference in the value of farms here, as compared with other States, and for the additional cost of maintaining stock through a northern winter, it would be unsafe to assert that farming cannot be made, not only comparatively but actually, a profitable pursuit in Massachusetts.

In addition to the cereal crops, turnips, beets and carrots can be raised with equal or greater advantage. Considerable attention has been paid to the cultivation of the last-named root, and from a table prepared by a well-known agriculturist, in Worcester County, it appears that the average of twenty crops, during a series of years, has been twenty tons per acre, at a cost of $4.97 per ton. This, at $10 per ton, would leave a clear profit of $101.20 per acre, and the gross value of the crop would be ten times the amount of that of cotton. But the comparison does not end here. The carrots could be fed upon the ground, and the elements of the entire crop remaining upon the farm would annually improve the land, whilst the cultivation of cotton works a continual deterioration of the soil upon which it is grown.

The deeper the examination the stronger the conviction that agriculture is here a profitable pursuit. It is a profitable pursuit everywhere. True, there are countries of great fertility, which, exporting a large portion of their products, do not make a flattering exhibition of national wealth. In such instances it is the disposition of the crops, and not the expense of their cultivation, which affects the national progress. But where the product of the soil is mainly consumed at home, there agriculture vindicates its claim to a profitable employment. How could it be otherwise? Is it not a rebellion against the decrees of Providence to assert, that man is to starve in an undertaking which God has ordered him to fulfil, and that the Divine promise of seed-time and harvest was a mockery, rather than a fruition?

If it cannot be denied that successful farming yields a smaller profit than may be obtained in commerce or the mechanic arts, neither does a reverse bring so deep a ruin. The annual insolvent list, that sombre record of wasted energy and blighted hope, is not loaded with the names of prudent husbandmen, overtaken in apparent affluence by a commercial or a moneyed crisis. The affliction of an attenuated dividend-sheet rarely annoys their creditors or disturbs themselves, and in the quiet of an unchequered life they stand secure from the gulfs which yawn for the more confident and adventurous tradesman. Yet, notwithstanding the depth and frequency of the reverses that attend almost every other walk in life, it is too apparent that an undue proportion of our population are avoiding the certainties of an agricultural life for the more exciting and illusive prospects which glitter in the train of commerce, the arts and the learned professions. The reasons for this course of action are, doubtless, various. But may it not, to some extent, be attributed to the system of farming which has so long and so generally prevailed? Is it not natural that a youth should desire to abandon an occupation which he sees has rarely been a favorite, and which is too often wanting in attractions for his age, and too frequently unattended with the remuneration due to incessant labor? In order to invest farming with the attractions of trade, it should be engaged in with the same intensity. The farm should be regarded as the capital of the operation, to be cherished and nourished as the fountain of all profits. The same attention should be manifested to increase its value as is shown to increase the capital stock in other operations. No fear that money expended on its improvement will be lost must be allowed to obtrude itself. A confidence in its ability to make a regular return of annual profits should be felt and expressed, not for the purpose of giving a factitious value to such property, for it needs no such help, but to draw attention to an employment of such vital importance to all, and to show that the safest of occupations may also be among the most profitable. To inculcate just sentiments in regard to the importance and value of husbandry, it is necessary that the farmer should be the teacher, both at home and abroad; and that his confidence in his teaching and the proofs of its correctness should be shown, not only by the crops he raises, but in the attractions by which he

leads his children to value a mode of life equally promotive of their interest and their happiness.

A judicious outlay of money upon farms, and an addition to the amount of labor now employed in their cultivation, is required by the necessities of the day. And if the mind of the farmer is as exclusively devoted to his pursuit as is that of the mechanic or merchant; if, like them, he shall be continually upon the stretch to discover when an improvement can be made, by which time can be saved or labor dispensed with; if, ceasing to look backward to the times and customs of his forefathers, he will heed the opinions and necessities of the present and the hopes of the future; if he will avail himself of the increase of modern knowledge and scientific skill, and substitute the improvements of the present day for the ascertained errors of the past; in short, if he will pursue his business for the same ends, and with the same zeal, as is exhibited in the kindred pursuits of manufactures and commerce, he will find no reason to complain of a remuneration fully commensurate with the toils and risks he has sustained. But it is not on the ground of individual profit alone that an increased attention to agriculture is demanded. It is essential to the prosperity of the State that a just relation in its leading pursuits should be maintained; that its available soil should be brought into cultivation, and an economical appropriation made of all its resources by their employment within its own borders; that inducements should be offered to check the emigration of its young men; that the market for its mechanical and commercial products should be enlarged upon its own soil; and that so far as may be, it should be rendered independent of others for its food as well as its clothing. These are some of the considerations affecting us as a political community, equally important with that of the immediate profit of agricultural production. And to these may be added considerations important in another view. The influence of agricultural pursuits upon the character of a people is of higher consequence than their economical results. Compared with most other professions, that of the husbandman demands a more constant exercise of the faculty of judgment. He is not tied down to a single operation throughout an entire year, but each day brings new thoughts and new demands upon his capacity. He is continually dependent upon his observation

and his reason in ascribing the effects that are around him to their proper causes. The intimate connection of his labors and his hopes with powers and influences beyond his discovery and control, eminently favors the development of his moral powers, teaches patience and self-restraint, induces a firm reliance upon Divine protection, and forms on the whole a character well calculated to temper the order of minds moulded and educated in professions, and amid scenes more exciting and uncontemplative.

In passing from the reasons that call for an increase of agricultural productions, to even a cursory notice of some of the means by which that object is to be obtained, our positions might well be reversed. Upon that branch of our duties I can hardly hope to command your attention; yet some allusion to the means of increasing the average standard of our crops would seem to be called for by the occasion. Conscious of wanting that knowledge of the details of agriculture that would qualify me to offer instruction and advice to practical farmers, I shall confine myself to a few observations upon the course of tillage, in the hope that their acknowledged propriety will recommend them to general acceptance.

The breadth of land to be tilled is a subject of consideration to the cultivator, and is among the first questions that arise in husbandry.

A good farmer will not waste his manure and labor by applying them to an unnecessary extent of soil. True economy will suggest, as experience proves, that the largest crops per acre are in general the most profitable; and there is little fear of overcharging the land with manure. The maxim that the earth gives credit for all it receives, holds good in farming; and as it is a law of chemistry that nothing can be wasted, there can hardly be an objection to bestowing upon the land, even profusely, whatever elements of fertility may be at hand. A great object in farming should be to restore and sustain the land to its primitive fertility; and this can only be attained by reducing the quantity in tillage to the supply of manure. The labor wasted in cultivating unmanured lands would be best appropriated to composting manure for a next year's crop.

No work upon land is so important as that of ploughing; and hence none has been so much the subject of attention and dis-

cussion. The state of perfection to which the plough has been brought is not perhaps susceptible of much further improvement. But the manner of ploughing,—the depth to which the ground should be stirred,—is a consideration of much moment, and, in the judgment of many, it is the point upon which all correct farming depends.

To the opinion that deep ploughing will answer as a substitute for manuring, and that it will render unnecessary the now common practice of rotation, it is difficult to subscribe. It would seem, if the crop when gathered contained the constituents of the soil upon which it grew, that a succession of the same crops would necessarily, by abstracting the elements of fertility, ultimately impoverish the land. This result might be considered as unavoidable, unless it could be shown that the components of the crop were obtained from the atmosphere,—a proposition that in its whole extent would rarely be assented to. That deep ploughing, by opening the land to the influence of the atmosphere and creating a deeper soil for production, adds to the power of the land, is manifest; and whatever difference of opinion may exist as to the extent of its usefulness, none can be felt as to the fact itself. If ploughing deep is essential, it is not the less so when the land is cultivated with the aid of manure, and the disuse of manure is unlikely to be recommended under the present state of agricultural science. Deep ploughing, then, should be adhered to in aid of the present system, and not received as a substitute for the usual methods of enriching the soils.

The rotation of crops has been so repeatedly and thoroughly tested, that the prevalent opinion of its usefulness, and indeed of its necessity to good culture, seems well established. But, without attempting to question the correctness of the opinion, a suggestion may be hazarded that some soils do not, perhaps, demand a regular change; and some old experiments in England, with others of more recent date, may be referred to as of interest upon this question. The earlier experiments were made by Jethro Tull, of Berkshire, England, at the commencement of the last century, who may be considered as the originator of the drill culture of England, and of deep ploughing. His system of agriculture was founded upon the principle that "the food of plants consists of minute particles of earth taken

up by the rootlets, and it followed that the more thoroughly the soil in which they grew was disintegrated, the more abundant would be the pasture [as he called it] to which their fibres would have access." In the culture of wheat, he sowed in drills on ridges formed for the purpose, and the interval of four feet and six inches between the ridges was stirred by a horse-hoe, and the space between the rows, on the ridge, was cultivated by a hand-hoe. He speaks of growing thirteen successive crops of wheat upon the same soil without diminution. The same mode of culture was resorted to for the turnip, and his system, after meeting much opposition, came at last to be adopted for the cultivation of that root. The merit of the system has been latterly much discussed, in lectures before the Royal Agricultural Society, and some interesting experiments have been recently made tending to prove its value in growing wheat.

"A Mr. Laws, of Rothamstead, has devoted portions of a field to wheat and turnips in the following manner: an acre of land is annually scarified and cleaned so soon as the crop is removed, whereupon it is ploughed and drilled with wheat. The annual average produce of the acre, without manure, is sixteen bushels, below which it has not been reduced by ten successive crops. The soil is a strong clay loam, resting, at a depth of five or six feet, upon chalk. In the case of turnips, treated in the same way, they cease after a few years to grow larger than radishes, nor will any amount or variety of manure that has been tried obtain a second succession of crops equal to the first. With wheat, on the contrary, the addition of four hundred pounds of Peruvian guano at once doubles the crop. The land yielding thirty-four bushels per acre for six or seven successive crops."

These experiments go to show that the common opinion that grain exhausts the fertility of soils more rapidly than the green crops, must be received with some qualification; and that clay lands, by the addition of suitable manures, thorough tillage, and diligent removal of weeds, may stand an indefinite succession of grain crops. And in this connection it should be remarked, that in England the corn crops are, at the present day, far superior, both in quality and quantity, to those of any preceding period; whereas, potatoes and turnips have become so precarious as to induce a belief in their ultimate failure.

These experiments, disproving, as they certainly do to some

extent, the commonly-received opinion as to the necessity of rotation, are extremely interesting. But it will be well to remember, should an attempt be made to practise these experiments, that the first and most important consideration is that the land is to be kept entirely clean, and that no method of ploughing, hoeing or manuring will enable a farmer to raise together upon the same soil full crops of wheat and weeds for an indefinite period. Upon the necessity of rotation, common observation and experience will enable the cultivator to determine upon the changes that good husbandry demands, and a thorough acquaintance with the nature and strength of his soil will be as suggestive as ordinary experiments.

If it be true that the growth of plants year after year upon the same soil, and the removal from the same of the entire produce, impairs the general fertility of the land, then it is necessary that the elements of fertility abstracted by the crops should be duly and adequately restored, which, as a general rule, can be most advantageously done by consuming the larger portion of the produce upon the soil. But however it may be obtained, the collection, preparation and proper use of manure is to the farmer a most important duty. The attention of the agricultural class has been for several years devoted to this subject, and a decided and successful change in the manufacture and preservation of manure is manifest. Still, of the mass of our farmers it may be safely asserted that but little more than half of the manure within their power of acquisition is applied to their soil. The importance of cellars to the improvement of solid, and to the preservation of liquid manures, is well understood, and the economy of compost has been too generally proved to require even a recommendation. But it may well be questioned whether the wastes of the house have received that attention from the farmer that their worth and his wants demand. The value of manure that may be collected around the house, from bones, vaults, drains and other wastes, and which has been to a very great extent neglected, exceeds in the aggregate the value of any crop grown in 1850, save that of Indian corn, and is not supposed to be over-estimated at $115,000,000.

Enough of this might be saved to add materially to the improvement of our soil, and to render the importation of foreign fertilizers as unnecessary as it is unprofitable.

Massachusetts at the present day purchases for consumption in other markets one-half of the provisions she consumes. She brings upon her soil a crop equal to that she grows. Possessing the components of her own and of her purchased crop, it is bad husbandry not to supply her soil with the elements of fertility which half her consumption withdraws. Her importation of foreign manures can hardly be justified by the example of England, since that nation imports but one-sixth of her consumption against the one-half purchased by us.

The aid given to the cause of agriculture by the improvement of farming implements has already been alluded to. The reaping machines, which have excited so much interest in England and France, have added much to the mechanical reputation of the country, while they have by their adoption materially lessened the cost of production. The necessity of obtaining the improved implements hardly needs be stated where labor enters so largely into the necessities of the farmer. A just economy will be sufficiently suggestive of duty in this particular.

It is to be hoped that the goal of invention in agricultural implements has not been reached, and that the time is not distant when the general use of the hand-hoe will be discontinued. The expense of hoeing makes too large an item in the cost of producing Indian corn. The mode of stirring the soil by the hand-hoe has no advantages over other methods now practised, and there would seem to be no reason why the labor of man should not, in this department of agriculture, give place to that of the horse. Horse-hoeing among other crops is of common practice. It can be adapted to corn and potatoes, as well as to turnips and other white crops.

Our duty to improve and protect manufactures, as well as agriculture, may well allow us to call upon the former to supply the desideratum of a practical implement for this purpose, and to offer to American genius a suitable reward for the invention. There can be no doubt that a sufficient stimulus is alone wanting to induce the mechanics of our own society to prepare a hoe that will largely reduce the expense of cultivating the two leading tillage crops of New England.

The attention bestowed upon the growing crops do not complete the duties of husbandry. The crops, when grown, are to be disposed of, and it is here that the discretion, intelligence

and judgment of the farmer will be required. If they are mainly sold from the farm, the elements of fertility are sold with them. It may almost be said the soil itself is sold. If they are consumed on the land, or their proceeds returned to it in manure, the fertility of the soil is maintained, and its capacity for production perpetuated.

The best disposition of the crop is to feed it to stock, and the high price of butcher's meat would seem to assure a profit to the operation. Sheep have of late grown unpopular in Massachusetts,—falling off fifty per cent. since 1840,—and this, notwithstanding wool is higher in the United States than in any other part of the commercial world.

A writer on British agriculture can scarcely be found who does not contend that sheep are the most profitable stock that can be raised upon a farm; and, in computing the expense of maintaining sheep, it can be shown that the increased cost of wintering them in this climate is fully met by the increased price of land in England, joined to other well-known charges upon her industry. In the face of the existing prejudice against the growth of sheep in this State, it may well be questioned if any one step on the part of the farmer would contribute more to his interest than the raising of good breeds of sheep, adapted equally for wool and for food.

In all the departments of agriculture, and in the general practice of the science, we are young compared with the nations of other continents. The selection of the most suitable crops for our varied climate; the adoption of the best mode of culture and the most profitable use of our productions, are facts that time and experience will make familiar. Under our institutions, and with our advantages, aided by the peculiar energy of our people, we may look for a career as useful in the arts of domestic life, as our national example has been cheering to the aspirations of the human race.

FARMING IN NEW ENGLAND.

From an Address before the Worcester Society.

BY WILLIAM BRIGHAM, ESQ.

On an occasion like this, it may not be unprofitable to consider some of the more prominent sources of encouragement to the New England farmer, and to inquire what he can do to improve and adorn our own New England. I am aware that there is a feeling quite too general among our ambitious and enterprising young men, that farming is not the pursuit that holds out the greatest promise of success, or if it is to be followed, other lands and other skies are more propitious to it.

If this be true, then we cannot hope to make much further progress in the science or pratice of agriculture. We cannot expect much further improvement of the hills and valleys, which our ancestors cultivated and which are made dear to us from having been associated with their virtues, labors and sacrifices. Our efforts must be directed to the maintenance of our present position. Better perhaps would it be to avoid this lingering but certain death, and let the forest again cover our hills.

Such a heresy as this can neither be maintained nor tolerated. It has no foundation in fact and should be repudiated. Its origin can be traced not to any true and reliable facts, but to that tendency so general of believing that the way of success and the means of success are in some distant land rather than in our own, and in some occupation other than that which we happen to follow. We hear of distant and fertile soils—of abundant crops produced almost without labor—of herds of cattle and sheep almost numberless grazing upon the green pastures through the whole year, and we think our lot is a hard one. But the whole story is not told—nothing is said about

the log cabin—nothing about schools and churches, which do not exist; nothing of fever and ague—nothing about lime water, unless your informant wishes to apologize for not being a strict temperance man—nothing about rattlesnakes and mosquitoes. You hear of nothing but great crops and rich land—the bright views of the picture are presented, and the dark ones veiled. So we hear of the wonderful success of the poor boy who has left his father's farm and engaged in the perils of trade, and after the labor of years has accumulated great wealth; but nothing is said of the other nine hundred and ninety-nine, who did the same thing and failed. The one instance of success is ever before us and the thousand failures are forgotten. Each one supposes that the brilliant success will be his, which can happen to only one in a thousand. Far better would it be to inculcate the doctrine that true success in life is not in the accumulation of great wealth, which is generally the result of great hazard—not in the attainment of high office, which is more often the thing of chance or of fraud than of merit, but in the steady devotion to an honorable pursuit, and in the acquisition of a competence for one's self and family. It would be difficult in the whole world's history to point out more honorable instances of true success than have been found among the farmers of New England. That class of men who have labored with their own hands upon the soil they have always been ready to defend,—who have been ready at all times, by word as well as deed, to cherish and support the institutions they loved. Other people may boast of their patriotism, courage and chivalry—and they are usually found about in the inverse ratio to the amount of boasting—but where do we find better examples of them all than among the men of New England? That class who for one hundred and sixty years after the settlement at Plymouth, pushed their way over our hills and valleys with arms in hand, and established their homes and institutions in spite of the cruelty of the savage and the hostility of their enemies. They feared nothing but the wiles of the devil, and they believed they found an effectual antidote for these in free schools and in the Christian ministry. If we had no other motive to cultivate our soil but a respect for these generations of men; it would be enough, and I see not how a New England boy can drink of the water which gushes from her

clear springs, or look upon the old trees, that cast their shade upon the defenders of New England's rights a century ago; or stand upon the hills long ago consecrated to human freedom, without feeling that this is a home worth keeping and worth improving.

It is a common error to under-estimate the soil of New England; and in order to confirm this error it is sneeringly said that its chief productions are granite and ice. It is true we have excellent beds of granite, and the time will come when we shall value them even more than we do now. And it is also true that our clear cold winters produce a most plentiful crop of ice. But neither of these productions, though they enrich our coffers, exhausts our soil.

The New England soil is a good one. In comparison with other countries, it may be confidently asserted that it is better than the soil of the Canadas, or any other British Province—better than the soil of several of the Southern and Middle States. It will produce larger and better crops than are found in Maryland, Virginia or the Carolinas. It is naturally better than England or Scotland, and no country in Europe has better elements or greater capacity for improvement.

This idea of the poverty of our soil is of modern growth, and was not dreamed of till the fertile lands of Western New York, and at a later day the more fertile lands of Ohio, Illinois and Wisconsin were opened for cultivation. These rich lands have offered great inducements to emigrants, and have so far tended to delay the development of our own resources. Besides, the cultivation of these lands has brought their productions into competition with our own and to the immediate injury to our agriculture. So, too, our agriculture has suffered from the fact that so much of the strength and enterprise of our citizens has been devoted to other pursuits. Manufactures and commerce have increased our wealth and promoted our general prosperity, but the great success which has followed them has tended to the neglect of our agricultural resources.

These causes of discouragement are now fast passing away. The rich lands of the West will become exhausted in process of time,—Western New York already begins to feel it. Competition with other sections of the country is not so severely felt as formerly. Our farmers must adapt themselves to the new state of things, and it needs no prophet to see that a brighter day is

soon to dawn upon New England agriculture than it has seen for the last forty years.

But the best guarantee for this improved state of things is in the vigilance and activity of our farmers. A manufacturer who should fail to have the most improved machinery, or who should not avail himself of all the modern discoveries and facilities in the practice of his art, would become a bankrupt. A navigator who should build his ship forgetting or neglecting the improvements of the last fifteen years, would soon find he had made a sorry speculation. A mechanic who should neglect to use any tools but such as were common a quarter of a century ago, would soon be compelled to admit himself behind the times, and unable to bear the competition of his wiser neighbor. So the farmer must avail himself of all the improvements—of all the labor-saving machines; of the best modes of cultivation; he must have the best breeds of cattle, and make himself familiar with the progress of his art—or else he cannot reasonably expect success. The age may be a fast one; but if it is so, our true policy is not to sit down and complain of it, and get left behind, but to struggle on manfully, and keep up with it.

I have said that the soil of New England is good—not one that will encourage indolence, but one that requires great labor, and is sure to yield an ample reward. More bushels of corn can be raised on an acre in Massachusetts than in any Southern State, and of a quality at least twenty-five per cent. better. No part of the country produces a better crop of hay or grain. In no place can better cattle be seen than on our thousand hills, and in no place is there a better or surer market for all the products of the earth. We have not the grapes of the Rhine, nor the oranges of Cuba or Florida; but we have a variety of fruits much better, and of more value than are found in any tropical climate. Our apple has already become a valuable article of export. We have, too, an abundance of stone upon our soil—and in some instances we may have a little too much of a good thing; but this evil will disappear as the country becomes more cultivated. It is far less apparent now to a man who has lived upon a prairie where a stone cannot be found, than to us who are on more familiar terms with them.

Next to a good soil, the New England farmers may find encouragement in a good climate. Perhaps some will doubt this;

but is not that climate best which tends to give the greatest vigor to the intellect and body, and enables the person to accomplish the most? In this view, neither the mild climate of the Southern States, nor the equal temperature of the West India Islands, gives those places any advantage over us. The English climate, with all its clouds, fogs and dampness, produces a better race of men than the sunny skies of Italy. Our climate requires labor, but it gives strength and enterprise. Life is as long here as anywhere, and health is as good. Let no man slander or speak ill of a climate which produces such good effects, even though the thermometer does range from twenty degrees below zero to one hundred above, and even though the winter does last half of the year. The climate of the West is milder, and the earth produces with less labor; but he makes a poor bargain who leaves the rocky fields and pure water of New England, where he can have health and vigor, for richer fields, covered with an atmosphere full of disease and death.

Another advantage which the New England farmer has is in the institutions of learning and religion with which he is surrounded. Here he can educate his children in the free schools. This advantage can best be realized by emigrants to places where these institutions are not found. Such emigrants may acquire wealth, their barns may be filled and their granaries loaded; but all this does not compensate for the loss they sustain. They have not that which alone can give wealth any value, and amidst them all they still long for their native hills, and the home of their youth.

Our agriculture is hereafter to derive much advantage from the diversity of our soil. There is no doubt that much improvement can be made by a proper admixture of soils; but to what extent this can be carried science and experience will hereafter determine. In this respect we have a material advantage over those countries whose whole soil is nearly of a uniform character.

Our agriculture will always have a material advantage in our ready market. New England can never lose its central position; and so long as it retains its commercial enterprise the market of the world will be open to it. It was called by the first settlers a remote corner of the earth; and as things then were it was thus designated with great propriety. It may now

with equal propriety be called a central part of the earth. It must be the central point of trade and commercial enterprise, not only for the millions within its borders, but for the greater number of millions which shall occupy the territory on the North, North East, and North West. No man who purchases a farm need be discouraged by the fear that his land will become less valuable by any cause other than his own neglect, or that agriculture will ever cease to be an honorable and remunerating employment. Such a thing cannot be in a community whose population is doubled in about thirty-five years, and whose commerce has been quadrupled in a shorter period.

There is much to hope for agriculture from the application of science. The skill of the mechanic has already done much in the invention and construction of labor-saving machines and improved implements. In this respect there has been the most decided change within the last thirty years. Mowing machines, reaping machines, threshing machines, horse-rakes and corn shellers, are all the work of the present generation. And the farmer that should still persist in using the plough that was in universal use at the beginning of the present century, would be regarded as a fit subject for yonder asylum.

Great mistakes are often made in the application of scientific principles, and it must always be so. It is too difficult a matter to be fully understood. A chemical process is going on continually about us—in the water we drink, in the air we breathe, in every particle of earth coming in contact with the atmosphere —in all vegetation—in the trees which shade us, in the houses we live in. Every thing is changing its present and forming new combinations. There is nothing idle in the physical world. Motion is the universal law. It may be invisible, but is none the less certain. In one thing there is growth, in another, decay, and the same law may govern both.

The farmer should have some knowledge of these chemical processes—such a knowledge as will enable him to apply them in his business. The mariner need not know why the magnetic needle points to the pole, or why the north star remains at nearly the same point; but the fact he must know and act upon, if he would navigate the seas in safety. So the farmer need not know why these chemical laws exist; but they will exist, and have full force whether he knows them or not. It is

as absurd for a farmer to despise scientific farming as it would be for a mariner to despise scientific navigation. The same storms overtake both the ignorant and the skilful mariner. The one knows how to use the winds and waves to speed his prayers; while the other is wrecked by them. To the establishment of agricultural schools we must look for the advancement of agriculture as a science. There accurate experiments can be tried and correct information obtained. Let our old Commonwealth, which is the first and foremost in every good work, take the lead in this, and she will commence a new era in our agriculture.

Amidst these encouraging prospects for the farmer, he is bound to afford his efficient aid in adorning and improving our community. In no part of the world is there a territory which has greater capacities for improvement than the old county of Worcester. Where are there such glorious hills and beautiful valleys as are here all about us? Nature has done her part, and man should do his. If we have not the grand scenery of the White Mountains, or the unbroken view of the prairie, yet we have that beautiful combination of hill and valley—of silvery lakes and running streams, which neither mountain or prairie scenery alone can give us.

Let us rejoice at what we have and resolve to improve it. Each can do something. The whole must be improved by an improvement of its separate parts. Let every man improve his own homestead, and the work is done. Why should not beautiful shade and forest trees line all our road-sides? Is it because they cannot be had, or is it too much trouble to take care of them? To such an objector let me say that he has but to go to the neighboring forest to find as beautiful trees as ever grew, and if he is willing to devote a few hours to removing and setting them by the road-side, they will take care of themselves, and will invoke the blessings of the traveller upon his head, when he, his children, and grand-children shall have all passed to their long home. Or if he will not do this, let him keep ruthless hands from such trees as grow up in spite of his neglect, and if he is not rewarded for his forbearance, the next generation will be. Better—far better, is it to line all our road-sides with our beautiful elm, ash, oak or maple, than to fill them with rubbish, and make them the receptacles of every

thing that cannot be kept anywhere else. Let this practice of improving our homesteads become general, and a new source of beauty will be created of incalculable value. Tree associations in some villages have done much to promote this end, and in some instances the private speculator has had the wisdom to perceive that a graceful elm, or a beautiful maple, would give increased value to his lots. Thanks be to avarice for accomplishing what good taste has neglected!

Our community could be much improved and made more attractive by greater attention to the improvement of the grounds about our dwellings. In many cases there is utter neglect; and it would seem that the cultivation of a fruit tree, or a flower, in the neighborhood of such a house, is regarded as an encroachment upon the rights of the brier and thistle, and as such must be most studiously avoided. Let the brier and thistle have their rights; but it is a mistaken kindness to allow them to monopolize the whole of a door-yard. If instead of this slovenly appearance, which offends the eye and makes home repulsive, a little attention was given to make the homestead neat, the grounds tasteful to the sense and agreeable to the eye, who does not perceive that it would tend to create a new attachment for home?

Want of time is no excuse for this neglect, and though often urged, has no foundation in fact. Every person who is able to own land can improve it. It costs nothing. It is but the amusement of the leisure hour. It is an amusement in which the wife and daughters can participate. In a pecuniary point of view it would be difficult to say in what way the value of the homestead could be so much increased. The bare walls may be covered with the grape vine, and the old building with our native woodbine, with which the forests are filled. Want of time or means to do these things is but the miserable apology for the want of good taste and reasonable good sense. It is evidence not only that the occupant is dead to the sense of beauty, but that he cannot appreciate that which helps make the humblest home a paradise.

Such improvements have a value beyond that of the gratification of the taste. Their value is real and substantial. They afford that which money cannot buy. The children grow up with attachments to the cottage and lands thus improved. The

flower and the plant in the garden speak the language of maternal affection. The tree which grows up with them is a companion not easily forgotten. The family joys, and it may be the family sorrows, are associated with them all.

These improvements so desirable to our community must be left in a great degree to the individual. The public taste may be improved, and to this end much is due to the efforts of our horticultural societies. In this respect we have seen a most wonderful change during the last thirty years. The exhibition of to-day is the best evidence of it, comprising as it does a variety of fruits and flowers taken from your own gardens, such as the whole county could not have furnished twenty years ago. Many who hear me may recollect the horticultural department of our exhibition at that time, which consisted substantially of a few mammoth squashes, some overgrown beets, and half a dozen long cucumbers. This is real and substantial progress, and creates a new cause of attachment to the land we love and make our home.

It is said that the New Englander, though fond of roaming the world over, and trying his fortune in every land, yet always retains a strong attachment to the land of his birth and her institutions. It is natural that it should be so. It has always been the land of the brave, and is now the home of the free—and God grant that it may always be so. If during the two hundred and thirty years since her settlement she has been able, amidst all the obstacles which beset her path, to subdue the wilderness and plant her institutions of learning and religion upon every hill-top, what may we not hope for in the future! The cultivation of her soil has hardly yet begun. Add two hundred and thirty years more to her history, and her whole soil will have become as a garden and her waste places will all have disappeared.

An early historian of Massachusetts informs us that the only regret felt by the first settlers, at their approaching dissolution, was that they could not live to see the future glory of New England. May not we—nay, may not many generations which shall come after us—express the same regret, and not live to see its greatest and noblest triumphs?

THE FARMER'S WANTS.

From an Address before the Worcester South Society.

BY HON. AMASA WALKER.

Nothing can be more evident than that the great want of the Massachusetts farmer, at the present day, is the means of enriching his land. His operations are limited, not by the size of his fields, but the quantity of his compost. He has more land than manure, and his farm is really not half cultivated. If he owns a hundred acres of land, he plants perhaps from five to seven annually. Why not fifteen or twenty? Merely because he has not the manure necessary to secure a crop. He has every thing else; the best of tools, and all the appliances of farming, and can get a good price for his products, but he lacks the one thing needful for him as a farmer, the means of securing the productiveness of his soil; and he cannot but see and feel that the science of farming, in his case, is reduced simply to the science of fertilization.

If all this is true, the important point to which the attention of the farmer should be directed is clearly indicated.

Many very valuable improvements have been suggested to the farmer within the last thirty or forty years.

He has been told that he must practice a rotation of crops, and this is now generally done. He has been told to preserve his manures from the wasting influences of the sun and rains, and barn cellars are very common at the present day. Probably there are one hundred now to where there was one fifty years since.

He has been instructed, also, to keep his barnyard well supplied with soil or muck, and this practice is now nearly universal.

He has been told also, that he may greatly improve his

swamps and other wet lands by drainage, and of the utility of this most farmers are well convinced. So far as the experience of the speaker goes, this is the most feasible and profitable of all the improvements suggested. He has his mind's eye upon a piece of land, which has, this season, paid the interest upon $500 per acre, which a few years ago did not yield an income equal to the interest on $10 per acre, while the expense of the drainage and improvements bears but a small proportion to the increased value of the land.

Deep ploughing or subsoiling, too, has been strongly recommended, and begins to be considerably practised. It is doubtless very beneficial.

All these improvements come very naturally into the present period of our agriculture, and deserve the attention of all friends of progress; but when all has been done, it is still true, that two-thirds of our land is miserably unproductive for the want of the means of fertilization in possession of the farmer, and the question still comes to us, what shall be done? The only answer seems to be, that if we have exhausted our farm resources, we must look abroad for a supply, if such can be had.

And here we come to a point when we feel the need of science, of such a knowledge of the nature of our soils, and the character of the foreign fertilizers that are offered us, that we may judge for ourselves, understandingly, in relation to the use of them. Farmers do not like to take a leap in the dark. Conscious of their ignorance of chemical compounds, etc., they don't like to meddle with them. The fact is, men must *know* things, or have an intelligent conviction that they are true, or they cannot believe them. They may assent to them; but there is a wide difference between assent and belief. We assent to many propositions, and assent to them so often and so long that we fancy we believe them, when in truth we do not. Now dogmas in agriculture, like any other dogmas, never influence our minds like clearly demonstrated truths.

If the farmer has no science whatever, he is compelled to receive all the teachings of agricultural chemistry on the mere say-so of somebody else, and of course will not be likely to feel that confidence essential to the practical, successful use of them.

This shows that the time has come when farmers should be educated in some degree to their profession. This has been

often said, we know; but it must be often repeated, until such an impression is made on the public mind that the desired object shall be accomplished. Farmers must understand something of agricultural chemistry. I do not say that they must become chemists; but I do mean to say that they should be so far familiar with those great facts and principles most intimately connected with their peculiar calling, that when they read of phosphates, carbonates, sulphates, nitrates, and the like, these things shall not be myths, but something they fully comprehend.

How greatly must it detract from the satisfaction of a farmer at the present day, to be utterly ignorant of terms he constantly meets with in newspapers and other publications? How much of what is written for his advantage must be lost by his want of a knowledge of even the vocabulary of agricultural science?

But it may be asked, where is the remedy for all this? How can the farmer who toils from day to day, and year to year on his farm and amidst his flocks, acquire knowledge of this sort?

We answer, in the first place he must be brought to feel the want of it, and such a desire to obtain it as will impel him to the necessary exertion. If farmers did feel this want and had this desire, the means would be within their reach. Where there is a will there is a way.

We know very well that this appears a formidable matter, and the idea that farmers may become intelligent on the chemistry and geology of agriculture is regarded by many as quite visionary; yet we feel assured, all this will be realized, and that the time is already come, when the work of enlightening the people on this subject should be commenced in good earnest.

It is not sufficient, however, to say that this can and ought to be done; those who insist upon it are bound to show its feasibility, and point out some means actually within the reach of the great mass of those engaged in agriculture.

In meeting this point then, as we shall endeavor to do in the most common sense manner, we shall say first, negatively, that this can never be accomplished by sending the farmers' sons to an agricultural college to be instructed. That is clearly impossible. Farmers are the great mass of the people, and how can they, from their very numbers, be educated at college? And then the expense could never be encountered by the farming interest, nor could the sons be spared from the farms, nor would

it be desirable to so far break up their habits, as farmers, as to put them under one, two or more years' tuition at college. Besides, colleges are made for professional men, not for the people, and their mission never was and never will be to educate the million.

No, as in the case of common school instruction, the agriculturists, so numerous are they, so busily employed on the farm, so unable, generally, to send their sons abroad for education, they must have the knowledge they need brought to their own doors. They must have HOME EDUCATION. But how is this practicable ?

Of course, it is not possible to present a perfect programme, or point out with entire precision the whole *modus operandi* of such an undertaking. Every system of education is a growth, a gradual development, springing from the obvious wants and circumstances of the people and the times. Our common school system affords an illustration of this law of progress. It is not now what it was a century ago, nor is it now what it will be probably a century hence. So must it be with a system of agricultural education. It must be, at first, simple in its organization, and partial in its operations ; but if once established, it will expand and perfect itself, as the wants of society may seem to require.

This system of education must originate with and be sustained mostly by the people. Fortunately for us, government in this country does not take care of the people ; they are left mainly to take care of themselves. In Europe, Continental Europe especially, the people are very much cared for by their government, tended and sheared like a flock of sheep, though, in truth, rather poorly tended, and rather closely sheared ; but with us, the people are free from such trammels ; all progress, all improvement, spring spontaneously from themselves, and govern ment is only called on to make such general regulations as our social wants require.

This being the fact, it is proper that we look to the people instead of their rulers, to initiate this great movement now so loudly called for.

Let us suggest then, as a commencement of this experiment of home education, that all the farmers in a town, desirous of improvement, should assemble together and organize themselves

into an association or club, and establish a weekly meeting during the most favorable season of the year.

Let an admission fee be fixed to defray necessary expenses.

Let the objects of these meetings be:

1. To discuss agricultural matters amongst themselves.

This they could readily do, of course. Each man could state his own experiences and tell in what he had succeeded and in what he had failed; and from this source alone much useful information might be imparted.

2. Let these clubs provide themselves with such agricultural works as shall be thought advantageous. These might be read at the meetings and commented upon, and this would form another source of interest and improvement.

This might be carried so far in time, should the resources of the club admit of it, that a good agricultural library might be formed of great value to the members.

3. A series of lectures on agriculture, agricultural chemistry, geology, etc., on a larger or smaller scale, should be established.

For this purpose, a suitable hall should be obtained, and all persons invited or admitted by paying a small fee. To these lectures and meetings, farmers might carry their wives and children; they would form a sort of lyceum, become one of the permanent institutions of society, and be an important instrumentality for diffusing the desired knowledge.

4. Connected with these associations, classes might be formed, composed of all the younger part of the farmers and any others who had the ambition and enterprise to undertake it, for the study of some text-book on agriculture. There are such works, many of them, at the present day. There is one particularly, which, having fallen under our notice, we can speak of with great confidence. It is called the Progressive Farmer, written by Prof. Nash, a member of the Massachusetts State Board of Agriculture.

In this work, the general subject is presented in such a plain and concise manner as to be perfectly accessible to every one. There is not a young farmer of common capacity who could not master the science of agricultural chemistry, geology, &c., as presented in that book. It would only require patient attention and perseverance. Questions are appended to the work in such a manner as to adapt it most admirably to the purpose of

which we speak, and the members of the class, after having carefully studied at home, might meet together, and answer the various questions proposed. This would be a very feasible, pleasant and useful manner of spending an hour or two of a long winter's evening; and, in the course of a few months, the whole book would be learned. By reviewing it together in the same way from time to time, the whole class might be made perfectly intelligent on all the topics of which it treats; and when this was done, what an important object would be accomplished! What a well-informed class of young farmers would this become! How well prepared to participate in the discussion which might take place in the clubs! With how much more advantage and pleasure would they pursue their labors on the farm!

We have the greatest faith in the practicability and utility of such agricultural classes.

5. Let these clubs be established in all, or most of the towns of the Commonwealth, and let them all act in harmony and concert for the attainment of the common object, the education of those engaged in the cultivation of the soil and the general advancement of agriculture.

6. Let each of these clubs send a large delegation to the annual exhibition of the central agricultural society, to which it belongs, and see to it that both the agriculture and horticulture of its own particular town or neighborhood were fully represented on such occasions.

That all this is feasible is beyond contradiction; the only question is, are the farmers sufficiently desirous of improvement to put forth the necessary exertion? Nothing else is wanting.

We are aware that many plausible objections to this general scheme may be started. It may be said that the carrying out of this system would involve too much expense. That lectures will cost a great deal, and such associations will have but small means.

To this we reply, that if these clubs were generally established, they might, by union of effort, secure able lecturers at a comparatively low price. Suppose, for example, that one of these clubs existed in five contiguous towns, and that each club should wish for a course of ten lectures on agricultural chem-

istry. This would make fifty lectures for the five clubs. Delivered one per week to each society, ten weeks would be required to complete a course. Now then, suppose these societies unite in the measure as they easily might, at what price could we expect to get a competent lecturer? Why, if a lecturer would have constant employment for ten weeks and should receive only ten dollars per lecture, he would get $500 for one-fifth of a year's work. This would seem to be a pretty good compensation, and yet the price of the lectures would be very low. Does any one doubt that lectures might be obtained on such terms, especially when he takes into consideration the fact that the persons called upon to give these lectures would be either those devoting themselves to popular lecturing, or professors in colleges who might perform such services without interfering with their peculiar official duties? A single lecture, or a single course for a single society, would not pay; but by the union of associations the matter assumes a very different and most satisfactory aspect.

Besides, why should not the State afford its aid to these associations as well as to larger agricultural societies? Why not upon the same principle that it assists the common schools and normal institutes? Why not extend to the farmers as much aid as it gives to its military, and expend $80,000 per annum, if need be, in teaching men to farm, as well as to fight? Why not appropriate to each of these clubs a sum corresponding in a certain ratio to the amount raised by itself? This would only be carrying out a principle already recognized by the State.

Again, it may be said that there are not enough persons qualified to give these lectures, if there were such a call for them as our plan supposes.

To this we answer, the supply would increase as rapidly as the demand. This is not only according to the well-established laws of economical science, but to all experience in analogous cases.

In 1828 there was but one lyceum in existence in Massachusetts, and not half a dozen in the world. At that time it was with great difficulty that lecturers could be obtained for a single course. But these institutions multiplied rapidly, until they spread over all the land, and lecturers multiplied at an equal rate, so that the more lyceums, the more easily were they managed,

and the more readily were their wants supplied. This was a natural consequence. Popular lecturing soon became a sort of profession, and a profitable one too; and the difficulty is not now to get lecturers, but to select them. Men would qualify themselves very speedily to instruct in these clubs and classes, if they were sure of employment at the low price we have indicated.

But it may be urged that people generally will not take sufficient interest in these meetings to attend them.

In deciding this point we must remember that the present age is remarkable, as compared with the past, for public gatherings and public lectures. This forms one of the marked features of the times in which we live. The people are becoming far more social in their habits. We see this illustrated in a thousand ways, and hence we may safely infer that popular lectures on agriculture, horticulture and kindred topics, could not fail to enlist the interest and secure the attention of the community.

Besides, if the farmers generally attended with their wives and daughters, as we propose, an audience would never be wanting. Wherever the ladies go, there will the other sex be drawn by an attractive force, the precise philosophy of which we may not be able to explain, but the power of which every accurate observer of men and things understands very well. When a lyceum was established in Boston, the first, I believe, in the State, it was confidently predicted that it would fail for want of an audience; but the experiment was made on the new plan of inviting ladies to attend all its public meetings, and beginning with an audience of about eighty, it went on increasing every year, until the largest hall in the city would not accommodate the multitudes who wished for admittance.

If it should be said that ladies will not feel an interest in agricultural subjects, we reply that this will be found a mistake. The geology, the chemistry, and the general philosophy of agriculture are, in their very nature, vastly interesting to every person who wishes to be intelligent, and all American ladies desire at least as much as that; besides, many topics will have a direct bearing upon some of their particular duties.

For example, suppose the art of butter-making,—a very important art, certainly, and one which our senses but too plainly

tell us is not always well understood,—suppose this were the subject of the lecturer? Would the ladies feel no interest in an explanation of its various phenomena? Every farmer's wife knows that when the cream is too cold, she finds it as difficult to make the butter come as it was for the allies to take Sevastopol, and that if it be too warm it is equally arduous; and to some of them, at least, we cannot doubt that the reason of this is a mystery. Would it not be interesting to all such to know what the true temperature required is, and why that temperature is indispensable? Now there is a philosophical reason for this, well known to the chemist, and a beautiful explanation can be given that every one may understand.

It was formerly assumed that women had no capacity or taste for philosophical studies, or any thing of an elevated or intellectual character; but the error has been discovered, and we now know that in all our high schools and other institutions of learning to which females are admitted, they are found quite equal to the other sex in languages, mathematics, or any other branch of literature or science; and that ladies attend upon the lectures of a Silliman or Agassiz with as much pleasure as the very lords of creation themselves.

In short, it would be found that all persons, professional men and mechanics, as well as farmers, would attend the meetings of the clubs, and it would be seen that every man who cultivated a piece of land, if it were not more than ten square rods, would desire information on these subjects; and, as a general thing, his interest in the matter would be in inverse ratio to the size of his farm, for the less land a man has the more necessity he feels for knowing the best modes of managing it.

If it be seriously urged that farmers cannot afford time for such a course of improvement, I answer, they cannot afford at the present day not to do it. If they cannot afford one evening in a week, during the most leisure season of the year, to attend upon such lectures and discussions as particularly appertain to their own interest, and tend to make them well informed in regard to their own affairs, their condition is indeed a sad one. But it is not true. If a man is active and energetic, he can find time for every thing. Most people waste a great part of their lives without being even aware of the fact. They squander those little scraps of time, those short intervals between one

duty and another, which, if rightly improved, would soon make them intelligent men.

We know of a person who, having occasion to travel much by railroad, carried the little manual before referred to in his carpet-bag, and by reading it at intervals, while riding, actually made himself so familiar with its contents as to be able to answer every question appended to the work. This was a great acquisition, and cost him really no "time" at all.

Let it be recollected that such a course of application as we propose will not be required during the whole of a farmer's life. If he wisely improves only a few years, especially in his younger days, the great work will be accomplished, and he will be left free, as he should be, to attend to other branches of knowledge. Will any man, especially any young farmer, grudge the time or effort?

We will not detain you longer by dwelling upon any other real or supposed objection to the general plan presented. If those we have already noticed have been satisfactorily met, if there be no insuperable obstacle on the score of expense, if lecturers may be had, if an audience may be secured, and the whole farming community thus have the means of constant improvement and progress, then we think the matter is worthy of attention, and the object we have had in view in presenting it is attained.

How gratifying would it be to know that two or three hundred of these clubs existed, scattered all over this Commonwealth, yet all united together in promoting the cause of agricultural education!

Were such the case, how soon would there be an effective demand for an agricultural college, in which to prepare men especially to lecture before and instruct all these farmers' clubs or agricultural schools, as they virtually would be, and how peculiarly appropriate that Massachusetts should take the initiative, and lead off in a movement so needful and beneficent! How justly proud we are of our common school system! How much true glory it reflects upon the State! What an appropriate addition would this make to her great educational establishments! And what an enhanced interest would the people take in the proceedings of all our large agricultural societies! How

much better would our annual exhibitions be attended, and how much greater their influence and usefulness!

The present tendency of things is in the direction of such a movement as we propose.

At first, we had only one agricultural society in the State, then a society in each county; now our counties are subdivided, and these societies are yearly multiplying.

In a few isolated cases, farmers' clubs have been formed and found successful. To complete the system, we want these small societies formed in all the towns, and the whole united into one grand and coöperative system of popular agricultural education, under the auspices and patronage of the government of the State. Shall we have it? The farmers, especially the young farmers, of the old Bay State, must answer the question.

THE FARMER'S ERRORS.

An Address before the Hampshire, Franklin and Hampden Society.

BY SOLON ROBINSON.

I propose to commence my address by a confession of my own errors, before I speak of yours. Last spring I wrote a little article, entitled "plant one acre more." It was a modest title, and a simple request; yet no doubt it increased the crops of the United States one million of acres. A friend wrote me, that if I had written with half the force to "plant one acre less," I should have convinced the whole country of its advantages, and instead of increasing the crops of a single year, I should have increased them in all time to come, and become one of the greatest benefactors of my race; for I should have taught men that they could grow two blades of grass where only one grew before. My correspondent contended that the great error of American agriculture was, that every body had been straining all his energies to plant one acre more, when with half the effort devoted to making one acre more productive, he could have produced more grain from half the number of acres usually planted; and instead of increasing the crop of a single year, whatever the chance production might be of a million of acres extra, hastily planted, the permanent production of the country would be from many millions of acres of land made to produce double their present average yield.

Now I am not stubborn enough to be proud of my errors, and to stick to them because they were the ways of my great-grandfather; though I am proud of my ancestors, yet I am not proud of their ignorance or my own. I remember that some of them used a plough, carefully gauged to prevent it from going too deep into the earth, because they looked upon that as fatal to their crops; and I have heard of the same thing within a month.

If any of you are still in your grandfather's furrow, you are more intent upon planting two acres more than you are of planting one acre better.

It is no mark of respect to your very respectable grandfather that you still stick to the same old routine of farming. I know it is a fact—at least I shall assume it so to be—that many of you do; and there is the error I want to show you, and I don't want you to be too proud to acknowledge it. Though I like pride—I would foster pride—I could take pride for a text, and preach a sermon that you and I might be proud of; and above all things, I would have a farmer proud—very proud—and all his family proud. What would a country be, without pride? What would a farmer be, without pride enough to improve? What would the house be, what would the town be, if no one took pride in altering, improving and keeping up with the onward progress of the age? Without such pride, a man would be as useless as a mushroom, which, if not plucked and eaten at the nick of time, would rot upon the spot where it grew, and sink back into the earth without leaving a mark of its existence. We infer the character of a man from the appearance of his premises. We form an opinion of the authorities of a town, whether they belong to the Rip Van Winkle or Jabez Doolittle family, by merely riding through the streets. The first, you may recollect, slept away twenty years of his worthless life; and the other built the first locomotive, which, for aught we know, is running yet, and in time will run over old Rip, and waken him from his second nap. I would therefore foster pride in the farmer's breast, that he should not merely try, in a year of famine like the one that threatened us last year, to plant one more acre, but to plant all his acres better—to improve them so that they would produce greater crops—to improve his premises so that they would be the noted feature of the road.

Wherever we see the fields badly tilled, the fences broken, the buildings dilapidated, the dirt in heaps before the door, the garden a wilderness of weeds, and the orchard an untrimmed mass of brush, we turn away in disgust, and say to ourselves, there is no pride; that man, like a beggar, has got used to a draggled skirt; his mind is past repair; his children are like the weeds in his garden, growing up to scatter pernicious seed over a fair land. That man may plant one acre more; he will

never plant one acre better. There is no hope for him; there is a small hope for his children, if you can arouse their pride, and awaken nature's strong impulse to imitate. And this is one of the benefits of agricultural shows. No matter what the inducement, so that it brings out the boys and girls that might otherwise be hiding in the weeds, or huddling in the chimney corner, and here teaching them that this fair earth was not created only to grow Canada thistles, white daisies and mullen stalks.

Nothing but ocular demonstration will serve to convince some men that their system of farming is not the best on earth, or that any larger crops, or better products, can be obtained than such as they have always grown. They are full of errors, but not willing to come up here and openly confess them. It will be a hard task to convince men that they can surely grow more produce upon one acre than they now grow upon two. Yet it is nevertheless a most certain fact; and I have no doubt that there are a few now listening to me who are saying to themselves at this moment, "as true as I live I will try." So do: there is no other way to improve. Go and try. I address this adjuration, go and try, to the young framers; for, so far as my experience teaches me, the New England States are full of men and farms that have scarcely taken one single step in the onward progress of agricultural improvement. In fact, the old farm has barely supported its occupants, by their hard toil, for a century, without making any provision for the increase of the family, who are consequently compelled to go away into a strange country, looking after new lands, instead of looking a foot below the surface of the fields at home. It is a fact, too, that such looking after new soil under that which has become exhausted is looked upon by the old men as a wild, foolish notion of the boys. Those who would improve either in tools or modes of tillage are discouraged by that ready answer of,—"Oh, nonsense! don't tell me about farming. I know as much as any man living about it; and as for your new-fangled ploughs and things, I don't believe a word of them. Mine are good enough for me."

If you planted one acre less, and all your acres better, you could have better products from the whole. It is not altogether in the seed, though none but good seed should be used; it is the soil and manner of cultivation that produce good crops.

It is true some fields are naturally more productive than others: the alluvial bottoms are more productive than the old pine plains that are considered wholly unfit for cultivation; but I have seen fine crops of wheat and clover growing upon land as poor as the poorest sandy plain in this county, by the simple addition of two hundred pounds of Peruvian guano to the acre. I have no doubt it can be done here as well as in Virginia.

Do you think that you could convince by argument or mere assertion, a man who has always grown Indian corn upon land that never yielded him ten bushels per acre of any thing but nubbins, that others have frequently grown two hundred bushels of sound ears upon every acre of large fields? or that one hundred and fifty bushels of shelled corn had been frequently produced, and occasionally still larger crops? Actual demonstration only could convince such men; and for this purpose it is good to bring them together to such festivals as this, where we can drink in whole draughts of knowledge at every step; and unless we wilfully close our ears and eyes, we must go away wiser men, women and children, than we were when we left home this morning. Ocular demonstration is a kind of proof that no sane man can reject, however self-opinionated he may be: and if he sees better wheat, rye, oats, potatoes, or bigger ears of Indian corn than he ever grew himself, he will be obliged to think that such things have been produced; and let me tell you that thinking is the first step towards improving.

You may say that the man who rejected ocular demonstration was a stubborn fool; but was he any more so than the farmer who sticks to the old routine of corn, rye, oats, buckwheat, year after year, upon the same shallow-ploughed unmanured fields; or cultivates his barren hill-sides, while a muck swamp lies idle at the foot; or leaves the orchard planted by his grandfather untrimmed, because his father left it so, and consequently grows a kind of apples known as "five to the half pint;" the only advantage of which is, that all that grow he gets, for the most intolerable apple-stealing boy in the community would be ashamed to be accused of robbing so mean an orchard? He was no more stubborn than the man who will not buy a new plough, because the old one is good enough; or perhaps, in his

stubborn opinion, better than any that have come into use since those old apple trees were planted. The man that will not buy farming tools of the best kind, and adopt all well-attested improvements, is more stubborn than the man that would not believe any man had seen taller corn than he grew. Have you any such wilful stubbornness in this community?

You cannot afford to grow poor corn, any more than you can afford to keep a poor horse, poor oxen or a poor cow. Is there a man in this assembly—I know there is not a woman—that does not know that keeping a poor cow is poor economy? If a man has such a one, he is very anxious to shift her off upon some one else. You would not trust a merchant that was half as improvident as half the farmers. He does not let half his capital lie idle. You do, for only half of your land is productive. You cannot afford to grow weeds; yet you do. Look at the growth upon your stubble fields. What if every one of those worthless, bitter weeds was a stalk of sweet clover? It might just as well have been if you had manured the land and sowed the seed. Don't tell me that the land is too poor to produce a growth of clover or grass; if you do, I shall tell you that you are too poor a farmer to own it. You can't afford to grow only fifteen bushels of corn to the acre, when without any increase of labor, and for an expenditure of six or seven dollars, you could grow seventy-five bushels; and instead of the wilderness of weeds that usually grow among the corn stalks, you could grow a valuable crop of turnips.

You cannot afford to use poor tools, because with good ones you can double your crop. You cannot afford to keep poor animals of any kind. A poor brute of a swine that will only fatten to one hundred and fifty pounds, will have consumed more food than one of the improved breed, that will make the same amount of pork at half the age. Yet there are ten of these worthless animals in the country to one good one. Look at the beautiful, improved stock exhibited at fairs every year, and then ask why you do not all have such. How can you afford to keep the poor ones?

There is no known limit to improvements that may be made in agriculture. The only difficulty in the way is a wilful, stubborn disbelief. We are too apt to be contented with the same meagre crops that have been produced so long that we

believe they are all that the land is capable of producing. Perhaps such crops are all that shallow ploughing, without manuring, can give; but can you tell what would be the result of deepening the soil one, two, or six inches? What if you opened it to the influence of air and moisture two feet deep? What if all your clayey lands were under-drained, and all your dry lands irrigated? What if dry land was made of all your swamps? and what if a million loads of swamp muck were mixed with the surface of your barren hills? Who can tell what would be the increase of your productions? Can any one tell me what percentage he could make upon his money, if he should invest it in guano, phosphates, or other concentrated fertilizers, and apply them judiciously to his soil? It is full time that every farmer in this county was able to answer that question.

What if I should tell you, that if all the plough land of the United States was ploughed only one inch deeper, it would add to the value of the land more than all the money at interest of all the farmers in America, and give an annual increase to the crops of more millions of bushels, ten times over, than have ever been gained by planting one more acre. It is a text that cannot be dwelt upon too long—plough one inch deeper. It is a text that should be cast in letters of iron upon every plough—plough one inch deeper. It should be graven in bold letters around every farm—plough one inch deeper. How can you expect to produce good crops upon land that never has been ploughed six inches deep? Shallow ploughing is one of the errors of a dark age, and one that must be looked in the face, and acknowledged, and amended. I have never yet heard of a single instance where deep ploughing has not proved beneficial. In a few instances, an injudicious turning up of a cold subsoil to a great depth has rendered the land almost barren for a year or two; but exposure of the coldest clay to the sun renders it fertile. And wherever the subsoil is of a nature that is unfit to incorporate at once with the top soil, then it may be deepened by the subsoil plough to great advantage. I have seen a great many fields, where all the earth below three or four inches of poor exhausted soil was an almost impenetrable hard-pan, and where the crops scarcely paid the cost of the annual scratching, called ploughing, that now have a rich mellow soil two feet deep. I look upon shallow ploughing as one of the greatest

errors of farming. Leaving great tracts, like our swamps, of the richest land upon New England farms, idle and worthless for want of draining, is simply a waste of capital; but making land barren by bad ploughing is a waste of both capital and labor.

Of all classes of men on earth, the farmers, taken as a body, are the greatest wasters of labor. Until within a few years all their work was accomplished by brute force. While art lightened the labor of the manufacture of every article that the farmer used, every thing that he produced was without the aid of art. None of his labors were lightened by machinery, except of the most simple kind. If I had the first plow I ever held, to exhibit here to-day, it would be the greatest curiosity of your exhibition.

When I was a boy, all the wheat and rye were cut with sickles. Cradles were only for oats, and reaping machines had not been created. The grain was all threshed with flails, and the greater portion of it winnowed in the wind, or with the old Dutch fan. How would an Illinois farmer look now, getting out a thousand acres of wheat by such rude means? Now ask yourself if the winnowing mill is an improvement; if the threshing machine is better than the flail; if the reaper is better than the cradle; or the cradle better than the sickle; for this is all modern improvement, as well as the horse-rake, the horse-hoe, the flexible harrow, and all these beautiful iron ploughs, and many, many other labor-saving implements for the farmer. And yet, improvements in agriculture are behind every other branch of industry in the world. Not only in labor-saving machines, but in many of the farmers themselves, who seem to be the most clumsy and worst-improved machines of all. And what is worst, they are the hardest to improve. They cannot see their errors; and if they do see them, are unwilling to make a confession, which they think they will do if they change their old system. I have known men who would not buy a new, smooth iron plough, because that would be an acknowledgment that it was better than their own old-fashioned, clumsy, wooden mold-board, wooden land-side model of their great-grandfather's plough, with its awkward wrought-iron share, which they had always contended was the best plough in the world. Oh how my back has ached, trying to push and

hold such a thing as this into the ground. I wonder if there are not a few of them still in use hereabouts. Perhaps they have passed away; but if they have, I venture to say there are some other things still in practice in this county, just as far behind this improving age as the oldest and awkwardest plough ever used in Massachusetts.

I think I see a man that looks incredulous. Let me ask him if he hills his corn. Oh yes, of course. Then you had better discard the improved plough, the reaper, the thresher, and winnowing machine, and go back to first principles in all things, as well as one. Did you ever think why you hilled your corn? I will tell you. Simply because your ancestor saw the Indians cultivate their corn that way, and followed the Indian fashion, and you have followed your grandfather. It never entered your mind why. The Indian did it because he never ploughed the ground, but scraped together a little mound of loose earth to support the stalks; and you, without a thought, have done the same. In that point of improvement you only rank with a Pequot squaw. You are as hard to believe that corn will grow better upon deep-ploughed land, with level culture, as the other man was that corn stalks could grow eighteen feet high, and bear the ears far above his reach. Yet it is true. You only want ocular demonstration to prove that you are as unimproving as the Indian, and you will correct this error.

There is another error that is very common in New England, though I don't know how far it is so in this county; and that is, land once in grass, always in grass. I don't know but my grandfather would have gone into fits, if he had seen his son breaking up the sod of his ancient meadow. I am certain that I have seen land mowed for less than half a ton to the acre, that had been mowed for fifty years in succession.

How well do I remember the farm that I toiled on when a boy. Within forty rods of the barnyard there was a swamp and pond, easily drained, that contained more manure than would accumulate in the yard in forty years; for there it had been accumulating for forty centuries. On that farm lived a man over eighty years old, who could not remember when some of the grass lots were ploughed. The same land was ploughed and planted, or sowed to small grain, year after year, and only manured when planted in corn, and then only half as much as

that crop required to make such a growth as good land gives. The same fields were mowed year after year; and many an acre grew little else but white daisies and five-finger vines, or where the land was a little moist, a growth of brakes; while the white birch and sassafras and whortleberry bushes, were constantly encroaching upon the fields. Old pastures, that once had been good fields, would hardly support one sheep upon ten acres, instead of ten to the acre. And this was the style of farming in Connecticut. They are improving now. There was no regular rotation of crops, in which grass held its place, and by the decay of its roots furnished pabulum for the succeeding crop.

How far does that system still prevail? Are there still some fields of sward which in this generation have never felt the plough? Break them up. Plough them deep. Plant corn and don't hill it, and see if it will grow. Follow with small grain, and with that clover or grass; and in that never fail. That is, never sow an acre of small grain without stocking the land with clover or grass; and with good culture your land will never become exhausted. True, if you carry off all the native phosphates of the soil, in bones and dairy products, you must bring back an equivalent in some form, or your land will grow barren and cease to produce human food. It is just as easy for the agricultural chemist to prepare an artificial soil for the production of a certain crop as it is for the good housewife to mix the ingredients of a good loaf of bread. It is just as natural for some men to make bad crops as it is for some women to make bad bread.

I perceive you have followed the custom of some of our agricultural societies of late years, in offering a premium for the best loaf of bread. I wonder if it has ever occurred to those who make the offer, how much better it would be to offer a premium for a treatise that would teach every one how to make it, and what are the constituents of bread; which would naturally lead the mind back to inquire what are the necessary constituents of a soil to grow wheat; and then would come the question, does my soil contain those constituents? and if it does not, cannot I add them, and thus grow the grain for my own bread upon my own land? In my opinion, there is no reason why a Massachusetts farmer should not grow his own

wheat, any more than there is why he should not grow his own grass, except the mere matter of calculation in dollars and cents, whether he can afford to buy the raw material out of which flour is made instead of buying the flour. You certainly cannot afford to grow weeds and buy flour.

Why is it that farmers never think of these things, and make the dollar and cent calculations? It is owing to a wilful determination not to let the light of science shine upon their minds, to teach themselves a wiser mode of cultivating the earth, or using such means of improvement as experience has taught other men is more profitable than the ways of our ancestors.

It is surprising how slow farmers are to change. There are thousands of ploughs in use this day in this country, more rude and inefficient than the original pattern of Carey. In fact they are but a small advance upon the old Egyptian plough described by Stephens, drawn by an old woman and a jackass harnessed together. With all due deference to the historian's classification, I think the jackass was at the plough handle. Half of the cotton fields of this country are ploughed with a small piece of iron fastened to a rough stick of wood stuck into a short beam, upon the sides of which are fastened the handles; the whole so light that a boy ten years old could carry it upon his shoulder all day. Drawn by one small mule, it roots a little furrow into a loose soil, an inch or two deep; and that is scraped into a ridge, upon which the cotton is planted. Corn ground is prepared in the same way, by the same rude implement. But there are ruder modes of cultivation than this; for there are many plantations in South Carolina and Georgia, where no plow is ever used. The work is all done by hoes. Not such beautiful light articles as are manufactured by the Bay State Tool Company in this town, but great clumsy tools, with handles big enough and long enough for a fence stake. On many of the rice plantations the grain and straw are carried upon the negroes' heads, and the grain threshed with clubs upon the ground, and the chaff blown out in the free winds of heaven. Slavery is called a "patriarchal institution." In one sense it is; for the labor is done in the same primitive style, upon some of the plantations, that it was when Abraham was a patriarch in Palestine.

If you please, sir,—I mean you over there,—don't turn away, or cock up your nose, and look just as though you wanted to say, "Ridiculous! What fools! Why don't they use ploughs? Have they no carts to carry their grain?" Go right home, sir, and look in the glass, and say, "Who is the fool—the stubborn, unimproving dolt, that is just as far behind his neighbors as the South Carolina negro is behind me?" Put that question to yourself. Acknowledge your own errors. You were cutting your rye and oats this very year with a cradle—a very poor one at that—while your neighbor's reaping machine swept down his fields one after another, cutting acres faster than you cut rods. You did not cut wheat, because you did not sow the seed; and you did not sow, because "they say"—noted authority with you—that wheat won't grow any more in Massachusetts. "They say," is a great liar. Plant it, sir, and feed it, and it will grow. You cut your grain with a cradle. It is ten chances to one that you intend to thresh it with a flail. I suppose you will winnow it in a machine, but it will be a borrowed one.

You were half frightened, half perplexed, and wholly vexed, a dozen times this summer, and scolded not a little about the intolerable noise of your neighbor's mowing machine; and declared—just as the fox did about the grapes—that you would not have one upon your farm; that is what you wouldn't. So you ground your scythes—the boys in their hearts cursed the grindstone—and went to your mowing, declaring that no mowing machine could work upon stony ground; and yet you dulled your cutter twice to its once; and finally, because you did not, for you would not, cut your grain and grass in good time, you lost nearly enough to pay for a machine, by the long rainy season that came on too soon for you.

Still you are not quite so stupid as the hoe-digging slave, or so wilfully unimproving as the shovel-ploughing cotton planter; because you have come here to-day to see how far ahead of you your neighbors are in improvement, and you sit tolerably patient while you are told of your errors, and by and by you will begin to acknowledge your faults, and then you will correct them. I am aware that it is not a very pleasant thing to be told of our faults, particularly by a stranger. But I beg to say, that I did not come here to find fault: I am not finding fault

with any individual in this community, because I do not know one. To me you are all strangers, and for aught I know may be all model farmers; but I don't believe it. I believe there are some owners of land in this region that ought to be indicted for cruelty to animals; not only their over-worked, half-fed, miserable breed of cattle, but for cruelty to themselves. They ought to be arraigned and tried at the bar of public opinion, and sentenced to have a little common sense instilled into their heads.

Now I would recommend to you to reverse your order of premiums. Give one each to the five worst farmers in the county. Repeat this every year. Appoint a committee to examine and report, and see how long they could find men willing to enjoy this unenviable distinction. Offer another prize to the family that can show the most old coats and hats sticking out of the window, and see how the trade in glass would improve about this time of year. There are but few men who have courage enough to be the poorest farmers in the town. Unless a man is by nature a sloven, he will not be one in a neat neighborhood. He can't afford it. Certainly not if you publish his name.

How is a man to know that anybody ever uses better tools than he does himself? By coming to such an exhibition as this, where he sees better ones, and begins to long to try them. I am sorry he cannot see a better assortment. There are not usually a dozen men in a county bold enough to buy a new plough until they know it has been tried, and that it will prove all right. It is a bold deed to introduce a new plough, or in fact any new farming tool, or new mode of farming. What would some of you say to a tenant or hired man, whom you should find some day with a plough and two yoke of oxen, ripping through your meadow, or old pasture sod? If you never before had seen the operation, you would be very likely to fret a little, at what you supposed would spoil the land. Yet next to turning a sod over, the very best thing that can be done to improve a turf-bound meadow, is to go through it with one of the latest improved subsoil ploughs, eighteen inches deep. And next to a good coat of manure, and upon some land still better, is the effect of a subsoil plough run in the bottom of every furrow in a ploughed field. It is not a very serious undertaking, if you use

the latest improvement in this implement, which runs far easier than the subsoil plough in use five years ago, which was then thought to be nearly perfect. In running a subsoil plough through a meadow to loosen a hide-bound turf, a furrow once in three or four feet is enough. There is another excellent tool called the Michigan plough, which has two shares upon one beam. The effect is, more completely to reverse and bury the surface of the ground; and it runs easier than any other plough ever made.

How would the French nation ever have known that there were better reaping and threshing machines than their own clumsy things, if the Yankees had not gone over to the great Exhibition, and shown the people how far ahead of the old world the new one is in agricultural implements? What has been done at that exhibition for a nation, is done here every year in twenty States, and a hundred counties. A dozen farmers could hardly come together and talk an hour, or show each other their tools and modes of using them, without each one learning something useful.

Only the other day I was present at a farmers' club, when some of them began to talk of the damage done by the curculio. They could not raise plums. Another one replied, "I have not seen an insect upon my plum trees in six years; and I have one hundred and fifty trees of the choicest varieties; and my fruit is like this—[making an exhibition]—sound and smooth every year." Here, then, was a perfect remedy for this great pest of the farmer and fruit grower. What was it? Could others succeed as well? Just as well. He planted his trees in the bank of an artificial pond, leaning over the water. The curculios, insects as they are, have reason enough to guide them not to deposit their eggs where the progeny would fall into the water and surely die. If we had only the reason of an insect, we might often counteract their work of destruction.

But I did not come here to teach you; I only came to ask you to think. If you do not raise as good grain and fruit, or rear as good animals, as you see at such fairs, I want you to think that you can do it. I want you to think that there are at this moment a thousand of Pharaoh's cattle dragging their lean carcasses through this county, whose sides are so thin, that if you should grease their hides and put a lighted candle

inside, they would serve for travelling lanterns. Such stock cannot be profitable.

I want some of the owners of this stock to go and see the farm of Linus Green, of Hadley—the man they laughed at for his efforts to improve his farm, and called him "compost Green." Who is green now, the men that laughed, or the man that made green fields?

There is another man in the same town, who calls himself a farmer, who throws his weeds and potato vines in the road, instead of the compost heap, and lets at interest all the money he can starve out of his farm, or cheat out of his heirs by skinning his land. But he is not Green, and I suppose he is too stingy even to get blue. He is a land destroyer.

Another man in South Hadley—perhaps you know him—owns the best bull exhibited at the Connecticut State Fair. You may learn something of him.*

I suppose if you should visit Moses Stebbins, of Franklin county, and see him putting salt upon his land, you would call him a fool, thus to waste his money. Perhaps some of you have called him so already. Go right home and salt your asparagus bed, your quince trees, your plum trees, and see who is the fool that did not know some of the most valuable uses of salt. Put salt into every compost heap, and salt every worm unto death.

Farmers in North Hadley and Sunderland haul leached ashes from Ware, some twenty miles, and find it profitable, notwithstanding the small amount of potash they contain. It is worth their while to think whether there is not some cheaper manure, or some way of producing the same effect. Suppose they buy potash, lime, phosphates, ammonia, and not haul the clay, and sand, and water,—mere earth—that composes the bulk of a pile of leached ashes.

I would recommend the use of guano—but one of your wise men condemns the use, and says it exhausts the soil. A man upon a poor piece of pine-plain land, that was absolutely barren, by the use of guano produced a fine crop of corn; and he wants to know if his land, that was worthless before, has been seriously injured. There is a man in Hadley that may give you some

* The speaker alluded to the President of the Society.

information as to what injury three hundred pounds of guano per acre will do an old-field pine farm, or whether it is throwing away money to throw such stuff on the land. Perhaps you could gain some information of Theophilus P. Huntington.

Some men seem to think it a great waste of money to expend it for farming tools. They look upon the purchase of three ploughs for one farm as monstrous extravagance; and a general expenditure for all sorts of improved implements as evidence of aberration of mind. Have these old fogies ever visited the farm of Samuel Parsons & Sons, in Northampton, and looked into their storehouse of farming tools—their reapers, mowers, horse-rakes, et cetera?

There is a man in Hampshire county who has dug ditches all over his farm, and laid down tile drains. What for? Simply to double the value of the land, and increase the production so that he can keep more than double the stock he did before. Was he a fool? Inquire of Willard G. Andrews, of Ware.

The grand difficulty is, that there are so many men who never change their fashion of farming. There are a good many farms in Hampshire county that never changed owners—in fact, never were deeded. The descendants of those who first claimed them from the wilderness are still in possession. These are New England homes. Beautify and improve them: improve and not impoverish your soil everywhere. If it is hungry, feed it. If it is wet, drain it. If dry, irrigate it. And in all things try to improve, beautify, embellish home; and in it you and your children will be happy.

I want you to think that this is not a mere idle show, got up for amusement. Out of it every one of you may learn practical lessons. Old men, whose beards are grey, may learn of beardless boys a lesson of wisdom. All men may learn—should learn—will learn—unless utterly stupid—something useful out of such an exhibition.

Boys will learn. It is a great school for them; and if there is a single one who has been kept away from this show by parent or guardian, that parent or guardian has done a wrong to that boy.

And have the girls and their mothers any thing to learn here? Perhaps you think I had forgotten this part of my audience.

Never. While I remember that I had a mother—one of the best and handsomest women that Connecticut ever produced—or that I have daughters, I never shall forget how much we all owe to woman. And is there any position that a mother can covet for her daughter, more glorious than to be the wife of an honest, independent, happy farmer, in a country like this? To be the wife of a man that is looked up to by his neighbors as one whose example may be safely followed—one whose farm is noted, far and near, as a model of neatness and perfectness of cultivation? To be the mistress of a mansion all her own, that may be the envy of every passer-by, because it is so neat, pretty, comfortable; such a sweet New England cottage home? To be the angel that flits through the garden, bidding flowers to bloom, and training roses and honeysuckles around the bedroom windows; or sweetening their fragrance with her sweeter smiles; or spreading the snowy cloth beneath the shade of the old oak at the door, to welcome her husband as he returns from his toil; or even tipping the cradle with her toe, while she plies the dasher with her hand, or busily moves the needle, singing a joyous song of praise the while, that she is the happy and well-loved wife of an American farmer—one of the true and only noblemen of this free land—one that should by rights rank as the pride and glory of America?

THE FUTURE OF AGRICULTURE.

From an Address before the Hampshire Society.

BY C. L. FLINT.

We have seen what progress has been made in practical agriculture, and the effect which this progress has had on the aspect of the State. It would not be fair to ascribe all this improvement to mere physical strength and energy. Within the last few years, agricultural knowledge has been systematized, so as to be made available in its application; and herein consists, in part, our superiority in agriculture over the ancients.

Science has unlocked the subsoil, discovered its absorbing power and exposed it to the air; it has made known the value of concentrated manures, and enabled us to tell the true from the false; it has laid open to us the nature and structure of plants, disclosed in them a system for the assimilation of food, analogous to the organization of the animal, and equally wonderful. At the same time, it has told us just what food the plant requires, and what part of this food is taken from the air and what from the soil. Our implements of husbandry, also, and our breeds of cattle, have not been neglected by it. Thus science, aided by the practical knowledge derived from experience, has vastly accelerated the progress of agriculture. I do not refer to mere theory and its deductions. I speak only of the application of mind to practice, and the investigations of men, who, to early practical knowledge of the details of farming, unite a sound knowledge of the true science of agriculture; who, not pretending to revolutionize farming or to make it a pastime, are modestly investigating the composition of soils and plants, of animals and manures, and who study to make their investigations of practical value.

But, notwithstanding the advance which has already been made, much—very much—yet remains to be done. The farmers and those immediately dependent upon them, constitute a very large proportion of the population of the State. When they are prosperous, all other classes must share their prosperity. Thus the farming interest has a right to call upon all to aid it in the development of the resources of the soil, and, by the aid of systematic knowledge, founded on a basis of unimpeachable facts, to direct its industry into the most proper channels. I know of no better means of advancing practical agriculture than the formation and energetic support of agricultural societies of various kinds. To them we are to look for improvement in the science and practice of agriculture. They bring men together engaged in the same pursuits and striving for the same object. All hearts beat in unison, and men meet to learn and to communicate, to observe and to show. By far the largest part of our most valuable practical knowledge is gained in our intercourse with our fellow men. Knowledge acquired in this way is as much more effective than knowledge drawn from books, as the impressions made by the human voice, and the human soul, speaking in it, are more effective than those made through the eye.

The government very wisely encourages these associations, paying annually the liberal sum of more than ten thousand dollars, to be distributed in premiums, with the simple condition that every agricultural society which shall receive this bounty, shall offer annually such premiums and encouragement for the raising and preserving of oaks and other forest trees, as they shall think proper and best adapted to perpetuate within the State an adequate supply of ship timber.

Yet, with all the great and acknowledged advantages of the county societies, their meetings must necessarily be unfrequent. Farmers live scattered all over the country, on every hill-side and in every valley. They are isolated from each other. They cannot act in concert and harmony. The merchant meets his fellow merchant to discuss the state of trade, to buy and sell and to keep up with his own business. He studies the fluctuations of the market with the same care and eagerness that the scholar studies his books.

But the town meeting is too often the only place where the

inhabitants of a town assemble for a common object. It is too often the case that neighbors have but few social ties, if they happen to worship God at different altars. I ask you all if this is right? Does it become us as townsmen? Does it become us as Christians?

The farmer needs some system by which all the improvements in his calling may be instantly brought to his notice; by which he may learn as early as possible the introduction of new machinery and new seeds, new breeds of cattle and new modes of treating the soil.

I know of no better 'change for him than farmers' institutes and farmers' clubs, which shall meet regularly and as often as practicable, to discuss the modes of farming and the principles which may be most worthy of application.

Suppose a farmers' club, for instance, established in every town and every village, furnished with a library suitable and accessible to all the reading community, meeting on grounds strictly neutral in politics and religion. What would be the result? In the first place it would promote the best social feelings and elevate the social qualities and the social position of the farmer. It would increase the intercourse between neighbors, separated, it may be, by sectarian and unchristian prejudices, as much as if an ocean rolled between them. Men would discover the sweet fountains of humanity welling up in many a heart, where they expected to find only bitterness and hatred. New and enlarged ideas would be spread abroad by lectures and discussions, placing before the thinking community whatever improvements others are making, and enabling many to adopt them, who otherwise would never even have heard of them. Farmers would become more and more interested in their vocation and more and more satisfied with it. The moment you bring mind to bear on the toils of the hand, that moment you dignify and ennoble them. Mind is the only thing that distinguishes the toils of man from the toils of the brute, and it is for this reason that those occupations, which neither require nor admit of the exercise of mind and thought, descend in some measure to the level of mere brute force. Let the farmer begin to think and to calculate and to educate himself for his calling, and he will have a respect for it which

he never felt before, and a self-respect which shall challenge and secure the respect of the world.

I do not speak without a knowledge of the exact situation of our small towns and villages. It has been my fortune to live in very many different ones in this and other States, and to have been more or less intimately acquainted with the inhabitants of them all. I am not so sanguine as to suppose that a club would meet with equal success in every place. In some, indeed, there is too much reason to fear that it would fail altogether, from the want of a few leading minds interested in the subject; but I believe that the number of these would be small, and I know of no better way of meeting the wants of those inquiring and thinking minds, which now form a large part of every community. I know of no better way of convincing the doubtful, that a cultivated intellect is not inconsistent with a body strengthened by honorable toil, or of showing that there is one thing in which all parties can unite—the cultivation of those higher social feelings which lie at the basis of all civilized society.

A beginning once made, however small, forming a nucleus for a library and a cabinet, enterprising and active minds would create a thousand facilities for enlarging and increasing it. Difficulties vanish the nearer we get to them. The lion is glad to get out of the way. No man ever succeeded who cherished in inactivity the delusive dream of hope.

Why, gentlemen, let such a club take up the discussion of the adaptation of flax to your lighter soils, and its probable profit, and I believe it would pay for all the trouble and expense of starting a club in every town and every village in the county.

Inquiring minds would look into the mode of culture, the extent of the demand, the expense of raising it, and the value of the crop. Facts would be brought out, which would throw light on the subject and encourage the cultivation of the plant. One would be surprised to find that the demand reached the utmost limit of the possibility of supply, and that the farmers of the West, raising it for the seed alone, can realize a profit which will enable them to throw away the fibre, which is itself worth nearly the price of hay. Another would discover that much of your soil is admirably adapted to it, that it requires only a moderate degree of fertility, that there is more danger of

having the soil too rich, than of having it too poor and light. Another would find out that it did not exhaust the soil, as has been supposed, but that all the fibrous part of the plant draws its substance and support from the air and from water, and that it is only the seed that draws upon the soil, and that only to a very limited extent, which could be supplied with the utmost ease, by feeding out the oil-cake to cattle, and returning it in the shape of stable manure. Another would find a home market which must now be supplied by importation from countries which can raise it no better than we, at a cost of six or eight millions of dollars annually. Establishments for the manufacture of thread and coarse cloth from flax would be found at Andover, Clinton, Willimantic and Webster. It would be evident that other similar establishments would soon start up in different parts of the country. Another would look into the uses and demands for the seed, its fattening properties for cattle, the average amount per acre and the price, and find equal encouragement there for cultivation.

Another would examine the improved machinery lately introduced, with facilities for the preparation and manufacture of flax never before known, and would obtain information in regard to flax cotton, and all the varieties of fabrics for which flax is now required more extensively than ever. With the lights which all these investigations would open, the club would come to the important decision of the propriety of offering a premium for this very crop by the Hampshire County Agricultural Society.

When the investigations connected with flax were concluded, the properties and value of root crops might be taken up and their peculiar adaptedness to the soil of your county would be impressed on the attention of farmers. Their fattening properties would be investigated. That would lead to experiments by one and another connected with the club, and experiments would perhaps show that an animal might be fattened on swale hay and turnips alone. Thus practical results of great value to our farmers would, from time to time, be arrived at, and questions would be settled which have been long discussed to no purpose, because men did not work together.

The same may be said of farmers' institutes, by means of which the highest intelligence of the country would be brought

to bear on agricultural subjects, and a large amount of information in relation to the cultivation of the soil might soon be accumulated.

But time would fail me, should I attempt to explain the various means by which public and associated effort may be made to act on the progress of agriculture. Individuals are doing much, by example, to elevate and improve the agriculture of the Commonwealth, and whether they are, in all respects, strictly practical men or not, they are deserving of lasting remembrance. But there are still some who oppose all the efforts of the friends of improvement, and look with contempt on all the exertions of our societies and their members, and grow impatient when they find that their expectations are not realized. They forget that every thing which is to be of permanent value requires the slow development of time and thought. I do not suppose any such are here to-day, but if there are, I can only say to them, plod on in the old style, if you will; but be assured that the longer you plod in the ruts of a former time the deeper you wear them, till at last, when you can no longer see to the right hand nor to the left, the tide of progress will sweep over and bury you beneath its current. Do not complain of the ingratitude of the present and its want of reverence for the past. The old has sometimes opposed the new, but the new would reject the old, only so far as it refuses to do the best it can, to use the light it has rather than grope in utter darkness.

The present has not lost its reverence for the past, as some suppose. It is only a part of the past that has ceased to command respect. It is that part of it only which was opposed to progress and to knowledge, for that part was unnatural and opposed to itself; for progress is the law of life, and to be opposed to a rational progress is in effect to die and be forgotten.

If we did not learn the best modes of farming when we were young, it was because there were then no facilities for doing so. We did the best we could and used the light we had. But now when we have these facilities, we will not say to our children, "We did so and so, and you may go and do likewise!" No! Rather let us tell them to study and comprehend the age in which they live. Tell them they are expected to do better than their fathers did if they can, and to imitate them only when

they can no longer improve upon them. Tell them to educate themselves for farming as a profession. Tell them the world will instinctively award its honors, its dignities and its power, not merely to those who are educated for the law, for divinity, for medicine, for teaching, or for the counting-room, but to those who are educated for their occupation. Tell them the professions, technically so called, have hitherto exerted an almost unbounded influence on mankind, only because they have done so much of the thinking for the world, have brought so large a share of intellect to bear on the progress of the race. For these reasons the world has bowed in reverence to their superiority of intellect, and has given a prominence, not to law, medicine or divinity, but to that intellectual culture which gives to life its grace, its harmony and its beauty, and which they may acquire as well as others. Tell them that science, stooping from its proud flight among the clouds and the stars, has shed its genial light around them and above. Tell them to learn of nature; to seek knowledge from the right hand and the left, and though to attempt to learn all her laws and observe all her miracles may seem as hopeless as to try to gather up all the pebbles on the shore of the sea, yet in the enlargement and elevation of mind which it will produce, every object will be clothed with the perfection and beauty which it had when it came from the hand of God!

But so long as farmers think that nothing is wanting but bone and muscle, strength of sinew and power of endurance; so long as they neglect all mental culture, and look with contempt on all intelligent farming; so long as they discard good taste and good language and good manners as unnecessary; so long as they disregard all sentiment and all refinement, so long will farming languish and be forced, by farmers themselves, to take its place among the mere mechanical employments by the side of machine and slave labor, when it might and ought to be elevated and dignified, as worthy of the highest intelligence, as opening the field on which human genius has some of its grandest triumphs to achieve!

PRACTICAL SUGGESTIONS ON FARMING.

From an Address before the Hampden Society.

BY C. L. FLINT.

The fact that the cultivation of carrots and other roots is an admirable preparation of the ground for after crops, is enough to recommend them to general favor, even more strongly than their intrinsic value.

The true science of root culture is to kill the seeds of weeds, which would otherwise cause great and unnecessary labor. I have seen a crop of carrots cultivated with as little expense as a crop of corn, and with a careful eye to the destruction of weed seed in the manure, the cost of these crops need never much exceed that of any other. Probably one of the most certain methods of keeping the field free from such seeds, is to apply only old and thoroughly composted and rotted manure. If this cannot be obtained, we may use the best of Peruvian guano, mixed in the soil by spreading and ploughing in. No one, who would cultivate roots cheaply and successfully, should fail to avail himself of such an invaluable implement as the onion weeder, a very simple wheel-hoe with which the ground may be stirred very frequently, the weeds cut out from between the rows, and the crop entirely saved from the effects of a drought, with but comparatively little expense. Some prefer to drill carrots and some other roots three feet apart, and to use the horse-hoe between the drills early in the season, and to sow a row of turnips between the drills of carrots a little later. This method has the advantage of saving hand labor, though the yield of carrots, which is thought to be a more profitable crop, is not as large. It is maintained by some that it is not desirable to thin carrots, if they do not stand thicker than ten or eleven to the foot, in the drill, and that the yield per acre is greater without thinning than with. Many facts

have been brought to my knowledge which seem to lead to the same conclusion, though further experiment is, perhaps, needed to establish it as a fixed fact.

The culture of turnips forms a most important part of the system of rotation of crops, in Great Britain, where the turnip is far more esteemed than any other root as a food for cattle. This crop would undoubtedly do very well on many of our soils, though the climate of Great Britain is better adapted to it than ours. The reply of Daniel Webster, to the neighbor who inquired how he should bring up his farm, is already familiar to most who hear me. "Grow turnips," said he. "To grow turnips the land must be well ploughed, highly manured, and kept free from weeds. It is a crop which, in the ordinary rotation, prepares the land in the best manner for those which follow it. It will do well on light loams, though better on heavier soils. Its yield is large and bulky, and to dispose of it to the best advantage, it ought to be fed off to the cattle in winter. This will force you to keep more stock, and in this way you will increase your barnyard manure, which will add to the fertility of the soil. You will have better cattle, and if you keep a few sheep, your lambs will come early to market, and will be in good condition and command high prices instead of being sold for their pelts."

The value of roots, as food for stock, is too well known to need comment. About twenty tons of turnips can be raised to the acre, and every ton of hay on the farm finds its equivalent in about three and a half tons of turnips. You raise, therefore, what is about equal in nutritive value to six tons of good hay per acre, when you raise a good crop of turnips. It is not very difficult to get eighteen tons of carrots to the acre on good land, and every three tons of carrots are equal in nutritive value to a ton of good English hay. Now some one will say, "But the labor of raising an acre of turnips or carrots is much greater than that of raising an acre of hay." This is true, to some extent, but as an offset to it, we should remember that the turnips are, at the same time, preparing the ground for a large crop of grass or other crops in succeeding years. In other words, it is a profitable and valuable fallow crop in the rotation, while its beneficial effect on the health of the animal is sufficient

to lead to its extended culture and use, if there were no other consideration in its favor.

Turnips, as well as other food, may be steamed before being fed out to milch cows in winter, to very great advantage; and if there is not stock enough to justify the expense of an apparatus for the purpose, a small pipe may be inserted in the kettle over the kitchen fire, and conduct the steam into a box filled with chopped turnips, cut hay and other substances. The whole contrivance will cost but a trifle, and will often pay well in the additional amount of nutritious, fattening and milk-producing properties of the food. It need not be stated that the apparatus should be sufficiently tight to produce a pressure of steam somewhat above that of the atmosphere.

He who loves his animals,—and the love of them is the indispensable condition of success in raising them,—will not fail to devise various means of providing for their comfort and good health, such as warm stables and a frequent change of food, with an occasional mixture of roots as a condiment. Above all, he who loves them as he ought, will not fail to see that they are not abused or roughly treated from the passion or wanton cruelty of their keeper.

The cultivation of fruit deserves mention in this connection. The farmer who hesitates to plant a variety of valuable fruit trees and to attend carefully to them, little knows how much he neglects his own interests. It is idle to say, "It will not pay," or that there is no time for it, or that the best means of making orchards productive are not understood. Experience shows that orchards can be made profitable, and even if they do not add to the actual present income of the farm, its value may be vastly increased in this way, since land well stocked with good fruit trees will bring a far higher price, and command a far readier sale than it would without them. I am convinced of this, both from experience and observation; for I have had occasion to examine nearly fifty farms offered for sale during the present season, and the difference in the management and thrift of the orchards and fruit trees was always a prominent subject of inquiry. I cannot doubt that a few hundred dollars spent in this way will not only afford great gratification to the owner, but will eventually prove to be an excellent investment.

It is the opinion of a practical farmer expressed to me on this

subject, that a tree at one year old, properly set out, will cost a dollar, and none of the best varieties of apple trees need cost more, at that age. Proper care and cultivation by way of stirring the ground, manuring and mulching, will cost a dollar a year for the first ten years, making in all ten dollars. When ten years old, it will begin to make a good return, and at the expiration of ten years more, it will have paid all costs, interest on the outlay and rent of the land. Then you have the tree free of cost for the rest of your life, and it will be a good legacy to your children, living and producing to the memory of its planter. But remember it is useless to set out fruit trees, unless you can afford to take care of them, and have made up your mind to do so. They are not profitable if neglected.

But some may say that everybody is beginning to raise fruit, and the market will be overstocked. It is important to bear in mind, however, that it is but a comparatively small part of the world that is capable of producing that noble and delicious fruit, the apple, in perfection, and that many other countries must look to us for it. The ice trade, which has grown up within the last few years, gives facilities for the transportation of all our fruits in perfection to all parts of the world. And when it is considered that our commerce now penetrates every sea, some idea may be formed of the extensive markets that are open to us. Let not this idea of too much competition deter the farmer from setting out and taking care of a good apple orchard. There seems to be no good reason for fear on this account.

It is surprising that so little attention is paid to the cultivation of the smaller fruits by farmers who have land enough admirably adapted to them, and who, following the routine of the staple crops, which require great labor in proportion to the profit, complain constantly that farming will not pay. The demand for the raspberry and the blackberry has never been fully supplied in any of our large cities. These fruits have many things to recommend their more extensive cultivation. They are easily raised, and the labor upon them is less irksome than upon many of the larger crops. They will bear well in land partially shaded, and hence may be grown under fences and walls, and among larger fruit trees. They may be cultivated on lands which cannot easily be ploughed, either from

their steepness or otherwise inaccessible character. They will, with proper care, produce very large crops and find a ready and increasing market. The value of an acre of raspberries in full bearing is at first sight almost incredible. I have known many small pieces to bear fruit worth at the rate of from five to eight hundred dollars per acre in the Boston market. No more healthy or delicious fruit can be found for home consumption, which should recommend it to every farmer who regards the health and happiness of a family as paramount to all other objects.

Those who have not land suitable for the culture of grapes, strawberries, raspberries or blackberries, may have it suitable for the cranberry, another very profitable crop, easily raised, and one which will never fail to find a ready sale and an increasing demand.

Closely connected with the transplanting of trees for the orchard, is their use for the general embellishment of the farm, the neighborhood and the town. I would not see the farmer stifle all sentiment and all taste for the beautiful. God never intended that we should shut our eyes to the refining influences of the beautiful, in nature or art; else why such profusion and luxuriance of beauty to adorn the world? But besides the gratification of our tastes and the cultivation of the highest and best feelings of our nature, by a little care for rural embellishment—although these alone should commend it to the earnest consideration of every farmer—I propose to consider the subject in a strictly practical view. Suppose a hundred acres to be owned to-day by Mr. A. and a hundred by Mr. B., both similarly located and equally good in point of soil and natural qualities, without buildings, orchards, or any thing else to make one place a cent more valuable than the other. Mr. A. and Mr. B. propose to build, each of them meaning to cultivate his hundred acres as a farm. Mr. A. is particular in the location of his buildings. He selects an elevated situation which commands a wide and extended prospect, with a landscape stretching away as far as the eye can see, all studded with beautiful lakes and mountains and forests, and a broad expanse of heaven, of which the eye can never tire nor the heart grow weary. Here he builds a neat and substantial farm-house, with some regard to architectural beauty. It stands back from the road with a wide

and beautiful lawn, and, perhaps, a comely avenue lined with trees. Every thing about the house shows the marks of taste, thrift and comfort, and every thing about the garden gives evidence of the care and attention of Mrs. A. and her daughters. The flowers and shrubs which they love to plant and cherish, and among which they drink in the sweet pure air, and grow healthy, and happy, and strong through the spring and summer, make their home the most beautiful and lovely spot on earth to them, and the farmer and the farmer's sons would not willingly be absent from it for a single day. Every variety of fruit hangs in rich profusion, and grows mellow and golden as the autumn advances, filling the cellars with the means of making the winter more cheerful, and adding largely to the fund from which the comforts and luxuries of the family are to be obtained.

Farmer B. had the same amount of money that farmer A. had. His land was equally well located. His house cost as much, but it was placed under the hill, because he thought the labor of carrying on his farm would be a little less. His barn cost as much with the exception of the cellar, which he could not afford to finish. He had no time to set out fruit trees, and besides that, there was no room for them around his house, because it was set directly on the road to save land. No piazza keeps the hot sun from the door or the windows, no vines creep luxuriantly up the sides of the house or hang in rich festoons to delight the eye of the traveller or the heart of farmer B. He looks only to what is substantial, and raises corn, potatoes and grain, a few ordinary apples, some pork, mutton and beef, and is, withal, a pretty fair specimen of a plain New England farmer, honest and upright, but a little behind the times. He jogs on very well to do in the world without working quite so hard as Mr. A., to be sure, but without the same exultant pride and satisfaction in the surroundings of his dwelling, till the time comes, when for some reason or other, both farms are offered for sale. Which do you think will command the highest price and find a purchaser most readily? He who does something, by the cultivation of ornamental trees for the embellishment of his farm and the adjoining highway, is a public benefactor.

In this connection I would allude to the existence of a general law for the incorporation of any ten or more persons as an

"Ornamental Tree Association." Such societies have been formed in several towns within my knowledge, and their influence has been felt, aye, and it will be felt and seen too, to the end of time. A few enterprising men, by united effort in this way, would double the value of real estate in many of our towns in ten years, and their works would be left behind them as an enduring monument of their taste and refinement.

Wherever these associations exist they will do well to make it a special object to look after the birds, and protect them from the wanton cruelty of those who would rob us of the best friends we have. In regard to the destruction of birds it is to be hoped that the minds of men will greatly change. If not, we shall try in vain to guard against the various grubs and worms which have so much increased of late as to cause serious apprehensions. This increase is, undoubtedly, in a great measure, the consequence of the diminution in the number of birds which feed on them. I believe that even the poor crow, persecuted and hunted as he is, does more good than harm, and as the corn may be prepared so as to be decidedly unpalatable to him, why not let him walk over the field and pick up worms, with the condition and the caution that he shall not touch the corn? Suppose we soak it before planting, in soft soap, and try that, and if that will not stop him altogether, let us try a little tar, afterwards rolling in plaster for the convenience of handling. If it is objected that this is too troublesome, we can soak a little corn in alcohol or rum, and scatter it over the surface of the cornfield and send him reeling and tumbling off as happy as any other bird. But as that might drive him away entirely, and as his presence is desirable, suppose we simply scatter a little corn over the surface and let him help himself, trusting to his honor to pay for it in labor?

There are other species of birds against which a merciless war is constantly waged. A more careful study of their habits would, in many cases, prove them to be of positive service to the farmer. The preservation of birds and insects beneficial to vegetation deserves the careful attention of every agriculturist.

RELATIONS OF THE EAST AND WEST.

An Address before the Franklin Society.

BY HON. GEORGE S. BOUTWELL.

I will not deceive myself nor attempt to mislead you, by assuming that the West is not a region of great fertility and abundant harvests. Equally fortunate is it for the East, as for the West, that it is so. I shall only venture to indicate that the West is not in every respect superior to the East, and that we have some compensations for the hardness of New England soil and the rigor of our northern climate. Our opinion of a foreign land does not rest so much upon its soil and climate as upon the character of its men. We well know that Egypt and Ireland are among the favored portions of the globe; yet we respect the perpetual enemies of Russia in the mountains of Caucasus more than we do the inhabitants of the Nile, and would sooner cast our lot in Sweden, Norway, or Iceland even, than cultivate the bogs of the Shannon or the moors of Donegal. One of the cultivated and useful men of Massachusetts asks me in a letter what opportunity the vicinity of my own residence furnishes for a home, when he shall be relieved from his present cares and labors. And he says, "what I most of all seek is a home among warm hearts and active souls, where there is pure air, pure water, and mountain scenery." We respect hills, mountains, forests, waterfalls, and the ocean. There is not only an inspiration in these, the grandest works of nature, but there is a religion in them also. The dweller among mountains, the wanderer in the forest, or upon the shore of the ocean, is a continual worshipper. God has made him so. Nature is not the same everywhere, and what nature is, man, to a great extent, is also. Indeed, without seeking for the reason or principle of the law, we expect the mountaineer

to be vigorous in body, and strong, though perhaps uncultivated, in intellect.

We associate physical indolence with great fertility of soil, and positive inability to labor with uninterrupted salubrity of climate. Switzerland is a small country; but her mountains are indicative of the greatness of her people, who, for ten centuries, by their comparative social purity and political freedom, have attracted the attention of the world far more than the populous states and principalities of Germany. Germany has, to be sure, a high rank for learning, but it is associated with a sluggish civilization, which might, under adverse circumstances, be easily exchanged for an effeminate barbarism. And the millions of the great Russian plains, if unsupported by mental or physical force from without, will too readily accept the conqueror's yoke, while the Swiss on the one hand and the Caucasian races on the other, would resist to the last extremity. A race of mountaineers may remain isolated for centuries without loss of spirit or character, though the graces of civilization might be totally effaced. But this cannot with truth be said of the inhabitants of flat countries. And we may, perchance, get a glimpse of the philosophy of this fact. Mountains are not usually fertile, while the great plains of Europe, Asia, and America, are for the most part productive with a small expenditure of labor. Now, if you separate one of these prairies, steppes, or plains from the rest of the world, what inducement to activity beyond the preservation of animal life remains? In mountainous and comparatively sterile regions, so great are the necessities of the inhabitants, that activity and labor are the common lot. The necessity for labor is the mother of what we call enterprise.

Where the necessity for labor does not exist and press as a general rule upon all, enterprise is unknown, or else is transplanted from other less favored regions. How often is it that the children of the rich are lacking in energy and enterprise, while these qualities are quite universal among the properly educated children of less favored classes? Men will not usually labor when the customary round of wants is supplied; and this round is more likely to diminish than to increase, when all external stimulus is withdrawn. Now, while mountains are favorable to animal life, they are not usually productive in the

means of its support. One alternative only remains; Men must work or starve. Though disposed as our race is to idleness, most of us accept labor when presented on such stern conditions. Yet we often accept it, or flee from it to more favored climes, as though it were always and everywhere a curse; while in truth there is within us all a principle which renders labor a blessing. I do not, of course, speak of the systems of Europe, or other servile systems, which compel the laborer to delve in ignorance for a bare subsistence. The New England laborer is not subject to nor in danger of any such degradation. When labor is regarded merely as a means of supporting life or of accumulating wealth, then it is a curse; but it becomes a blessing when viewed as a process by which we achieve a victory over the resisting forces of nature or art. It is not the glory of Christ or of Christianity that its founder was without temptation, but that being tempted he was without sin. Virtue, genius, plain intellect, manual labor, respects itself and is respected in proportion to the obstacles it overcomes. Marshal de St. Arnaud and Lord Raglan, though unsuccessful in the Crimea, are, after all, more distinguished than they would have been had the Russians fled precipitately beyond the isthmus of Perekop. Labor, labor of the hands merely and for a subsistence only, is and ever must be menial; but it is dignified and ennobled, when, guided by the intellect, it overcomes the obstacles which lie in every man's path. Labor is a blessing just in proportion as it is an achievement.

A life which accomplishes nothing is nothing to the world. The labor which such a liver is obliged to perform seems justly enough to him to be a curse. But do you not think that the labor of the astronomer, the chemist, the mathematician, the poet, is a blessing? Indeed it is; and his labor is as severe as any manual labor can possibly be. Why then, thou mere denizen of earth, is labor to him a blessing and to you a curse? Plainly because you accept labor as a yoke upon your own neck, instead of seizing it as an instrument in your hands, by whose agency you will achieve a victory over the obstacles in your way. Labor, to be sure, is an instrument by which we acquire a subsistence and accumulate wealth; but an instrument, too, by which we demonstrate the supremacy of an intellect over the inanimate creation. Now this highest form of labor can exist

only when there is enterprise, and enterprise is the child of a common necessity. And there is no reason in the nature of man why agricultural labor with us should be a struggle for a subsistence merely, and therefore to be avoided as far as possible. It is an art; it invokes and will employ a high order and great variety of learning; it develops the physical man; it cultivates and chastens all moral qualities, and it stimulates the intellect. Agriculture in Massachusetts is not on the one hand so hopeless as to leave men in despair, nor, on the other, has nature been so generous as to invite us to rely upon her spontaneous products. Excellence is an attainment through struggle and labor amidst the active competition of other men. We judge men, men judge themselves, not so much by their actual attainment, as by the process of the struggle and the obstacles which have been overcome. If you see a farm in the highlands of Worcester equal to the best cultivated one on the alluvial banks of the Connecticut, the Worcester farmer at once takes the highest place in your esteem. And this preference does not rest upon the superiority of the attainment, but upon the evidence which it furnishes that there has been a higher exhibition of enlightened labor, energy, enterprise and genius in the one case than in the other. And you will pardon me if I say, in illustration of a view I intend to take, that the Connecticut River farmers, though more favored in soil and climate, are not the best farmers of Massachusetts. If, in your minds, agriculture is a mere means of sustaining animal life, then no doubt you should place yourself where it can be sustained with the smallest amount of physical labor. But agriculture takes rank with the highest forms of labor and learning where and only where there is opportunity, inducement and necessity for the highest exercise of the intellectual faculties. Now no man can pretend that agriculture in the West is the intellectual exercise that it is with us. It may indeed be true that there is as much mind employed upon the land there as in New England; but let no one assume from existing facts that the equality will be maintained through generations and centuries. The West has no character of its own. It is a vast lake, kept constantly in motion by the number and force of its tributaries, whose currents are distinctly marked over its whole surface. When immigration into the West shall cease, that vast region will be what its own

wants require, influenced in some degree, of course, by the surrounding country.

We all anticipate that the valley of the Mississippi will be the home, the happy home of millions and tens of millions of human beings. There, no doubt, the graces as well as luxuries of civilization will abound; but it is not probable that the chief abodes of art, of science, of intellectual labor, of inventive, creative genius will be there.

But plains not only fail to nourish and strengthen the physical man by pure air and water, and an ever-pressing necessity for labor, but they lack proper food for the intellectual man. Where are the poets, born upon the plain, or the poets who have sung of the plain. The plain is destitute of inspiration. The inspiration common to all men has its root and support in the feeling that we are in the presence of God. To be sure we are in his presence always; but there is no language of the plain, it has no voice, it utters nothing, it reveals nothing, to the mind or soul. In a flat country, a hill, however insignificant, is a relief. A few weeks ago, a friend standing by my side in one of the level towns of the Old Colony,—and no part of Massachusetts can be called a plain,—pointed with zeal to the Milton hills, evidently gratified by the view, even at a distance, of so trifling an elevation of land.

It is difficult to say how far the operations of the mind are self-acting. We are influenced by what is around us. The sun, the moon, the planetary host, the myriads of stars, not only perform their parts in the great system of celestial mechanics, but they perpetually invite and attract men to the paths of science and religion. Paganism, or that form which bids men adore the sun, is sincere worship, though its proper object is unknown.

Yet it is certain from this that we are so constituted as to accept the instruction and influence of God's revelation in nature. And what is true of the influence of other worlds and systems, is in a degree true of the globe on which we dwell. A single majestic tree, a forest, a cataract, a mountain, the ocean, will often compel us to homage and adoration. So a stone, a leaf, a shell, a flower, we know not why or how, stimulates a mind so that it advances to new regions of science and heights of learning. No part of the world is destitute of these teachers

and preachers of science and religion; yet the mountains and ocean-touched portions are the most favored in this respect. Whatever is majestic, grand, sublime in nature, tends to produce the like qualities not only in the student but even in the common observer. So true is this, that a race may become distinguished for the qualities which their native scenery seems calculated to inspire. The mountain and the ocean are specially fitted to exert an influence upon the character and physical constitution.

There are individual cases of eminent men who are of inferior physical development; but it is idle to expect a race of such men. It is not necessary to urge this view; as a general truth it is agreed to. It is not, however, to be assumed that mere greatness of body is an index of greatness of mind; but where a race is well developed, you may be sure that it possesses great original energy and is capable of cultivation and refinement. You may see in State Street, Boston, at one o'clock in the afternoon, as fine a class of merchants and men as any city can boast; but generally they are immigrants from Cape Cod, Cape Ann, Western Massachusetts, Vermont, and New Hampshire. Now a great city and a great plain are alike in one respect; they must be constantly stimulated to industry and re-invigorated by the infusion of new elements of character from the country around. It is apparent then that great plains can only be the abode of an elevated and enlightened civilization, when they are so situated as to receive new men from the mountains and shores of the ocean, and have avenues of commerce which draw away whatever is produced beyond the necessaries of life. This is indeed now, and for an indefinitely long period of time to come, is likely to be the condition of the West. But the view we have taken leads me to consider what the effects upon American character would have been had it been possible to have settled the plains of the West before the Atlantic slope was occupied. It is possible that the heart of America would have been, like the south of Russia and parts of Asia, destitute of a high civilization. Western men of this generation may well doubt whether they are not as favorably situated for developing the higher qualities of our race as any other people. They have great energy now; but be it remembered that they have drawn from the old states and from

Europe the most energetic part of the population. It would not indeed disturb the view which I have presented, resting as it does upon general principles, if the first and second and third generations should retain the characteristics of their origin; but the census of 1850 exhibits many facts tending to prove that the West, as a producing country, is inferior to New England. Of course it is not assumed that the returns of any one census will demonstrate the truth in regard to a subject so complicated as this; we must leave the question open as a practical one in America until a future day. I think, however, that the results which the census of 1850 furnishes, are sufficiently important in this connection to be laid before you.

Ohio is a first-class state and a representative state. It has its generation of men who were born within its limits. It compares favorably with any section in the nature of its soil and climate, and facilities for internal and external commerce. It was as fortunate as any state in the character of its settlers. They were hardy, enterprising men from New England, New York, and the states of Northern Europe. Her character was drawn from high and pure sources; and I believe that in regard to education, internal improvements, and manufactures, no state, new or old, has been animated by a better spirit.

By the census of 1850, Ohio had a population of 1,980,329. Her products were as follows:—

Slaughtered animals, valued at				$7,439,243
14,487,351	bushels	Wheat at $1.00,		14,487,351
13,472,742	"	Oats .30,		4,041,822
59,078,695	"	Corn .50,		29,539,347
5,245,760	"	Potatoes .25,		1,311,440
1,443,142	tons	Hay 7.50,		10,823,565
34,449,379	pounds	Butter .15,		5,167,406
50,819,542	"	Cheese .07,		1,457,367
10,454,449	"	Tobacco .10,		1.045,444
10,196,371	"	Wool .40,		4,078,548
Orchard and garden products,				909,925
Various agricultural products not here enumerated,				1,854,738
				$82,156,196
Home manufactures,				1,712,196
Product of manufactures, mining and the mechanic arts, exclusive of the raw material,				27,969,322
Total product,				$111,837,714

Deduct interest at 6 per cent. on $400,528,726 invested in manufactures, farms, and implements, . . .	$24,031,723
Balance, ...	$87,805,991

This gross product of $87,805,991 gives an average product to each inhabitant of a trifle over forty-four dollars. If we omit to charge interest upon the capital invested in mining, manufactures, and the arts, and also upon the estimated cash value of the farms, the average returns to each person would be fifty-six dollars.

In 1850 the population of Illinois was 851,470. Its agricultural and manufacturing products were as follows, viz. :—

Slaughtered animals, valued at				$1,972,286
9,414,575	bushels	Wheat at $1.00, ...		9,414,575
10,087,241	"	Oats .30, ...		3,026,172
57,646,984	"	Corn .50, ...		28,823,492
2,672,295	"	Potatoes .25, ...		668,073
601,952	tons	Hay 6.00, ...		3,611,712
12,526,543	pounds	Butter .15, ...		1,878,981
1,278,225	"	Cheese .07, ...		89,475
2,150,113	"	Wool .40, ...		860,045
Garden and orchard products, ...				573,543
Various agricultural products not here enumerated, . .				628,177
				$54,546,531
Home manufactures, ...				1,155,902
Product of manufactures, mining and the mechanic arts, exclusive of raw material, ...				8,320,900
Total product, ...				$34,023,333
Deduct interest at 6 per cent. on $108,924,238 invested in manufactures, farms, and implements, . . .				6,535,454
Balance, ...				$57,487,879

This gross product of $57,487,879 gives an average product to each inhabitant of sixty-seven and fifty one-hundredth dollars, or about twenty-three dollars above the average in Ohio. If we omit to charge interest upon the capital invested in agriculture, manufactures and mining, the average returns to each person will be seventy-five dollars, against fifty-six dollars in Ohio.

In 1850, the population of Wisconsin was 305,391. Its products of agriculture and manufactures were as follows, viz. :—

Slaughtered animals, valued at				$920,178
4,286,131 bushels	Wheat at	$1 00,		4,286,131
3 414,672 "	Oats	.30,		1,034,401
1,988,979 "	Corn	.50,		994,489
1,402,956 "	Potatoes	.25,		350,739
278,662 tons	Hay	6.00,		1,659,972
3,633,750 pounds	Butter	.15,		545,061
400,283 "	Cheese	.07,		28,019
253,963 "	Wool	.40,		101,585
Garden and orchard products,				36,965
Various agricultural products not here enumerated,				357,076
				$10,314,616
Home manufactures,				43,624
Product of manufactures, mining, and the mechanic arts, exclusive of raw material,				3,878,137
Total product,				$14,236,377
Deduct interest at 6 per cent on $33,552,279 invested in manufactures, farms, and implements,				2,013,136
Balance,				$12,223,241

These three States may be justly deemed a fair illustration of the productive labor of the West. Ohio, one of the oldest, Wisconsin, one of the youngest, and Illinois, intermediate between them, and all having a fertile soil, temperate climate, and superior natural advantages for external and internal commerce.

I have selected Vermont and Massachusetts as representative States of the influence of the ocean and mountains upon national character. The present generation in these States is substantially the same in its origin with the inhabitants of Ohio and Illinois. In the popular judgment they are not so blessed in soil and climate, though it is the fact, I believe, that Vermont is quite underrated, as an agricultural State, by the public generally.

In 1850, the population of Vermont was 314,120. Its products of agriculture and manufactures were as follows, viz. :—

Slaughtered animals, valued at				$1,861,336
535,955 bushels	Wheat at	$1.50,		803,932
2,307,734 "	Oats	.40,		923,093
2,032,396 "	Corn	1.00,		2,032,396
4,951,014 "	Potatoes	.40,		1,980,405

866,153	tons	Hay	10.00,	$8,661,530
12,137,980	pounds	Butter	.20,	2,437,596
8,720,834	"	Cheese	.08,	697,666
6,349,357	"	Maple Sugar	.10,	634,935
3,400,717	"	Wool	.40,	1,360,286
104,649	"	Pease & beans	1.50,	156,973
Gardens and orchards,				334,108
Various agricultural products not here enumerated,				457,567
				$22,341,823
Home manufactures,				267,710
Product of manufactures, mining and the mechanic arts, exclusive of raw material,				3,569,543
Total product,				$26,179,076
Deduct interest at 6 per cent. on $71,107,886 invested in manufactures, farms and implements,				4,266,473
Balance,				$21,912,603

By this estimate we have an average product to each person in Vermont of $70, while upon the same basis we obtain an average in Illinois of $67.50, in Wisconsin of $40, and in Ohio of $44. If we reject the item of interest, we have an average in Vermont of $83 to each person, being eight dollars more than the average in Illinois, the highest of the three Western States named.

Massachusetts is not an agricultural State, though about one-fifth of her whole male population are employed upon the land. The number of inhabitants, according to the census of 1850, was 994,514. The products of agriculture and manufactures were as follows, viz. :—

Animals slaughtered, valued at				$2,500,924
3,585,384	bushels	Potatoes at	$0.50,	1,792,692
481,021	"	Rye	1.00,	481,021
1,165,146	"	Oats	.50,	582,573
2,345,490	"	Corn	1.00,	2,345,490
112,385	"	Barley	.70,	78,669
43,709	"	Beans & pease	1.50,	65,563
651,807	tons	Hay	10.00,	6,518,070
8,071,370	pounds	Butter	.20,	1,614,274
7,088,142	"	Cheese	.09,	637,932
795,525	"	Maple Sugar	.10,	79,552
138,246	"	Tobacco	.12½,	16,589
585,136	"	Wool	.40,	234,054
Garden and orchard products,				1,064,015
Various articles not enumerated,				153,953
				$18,165,371

Home manufactures, ...	$205.333
Product of manufactures, mining and the mechanic arts, exclusive of raw material, ...	65,280,374
	$83,651,078
Deduct interest at 6 per cent. on $195,643,573 invested in manufactures, farms, and implements, . . .	11,738,614
Balance, ...	$71,912,464

This amount yields an average of seventy-two dollars, against forty dollars in Wisconsin and forty-four in Ohio.

If we disregard the interest account, Massachusetts exhibits an average return upon all her inhabitants of eighty-three dollars.

We have then this general result:—

Computing interest on the capital invested, we find the production in Wisconsin to be forty dollars, in Ohio forty-four dollars, in Illinois sixty-seven and a half dollars, in Vermont seventy dollars, and in Massachusetts seventy-two dollars, to each person.

If we omit the item of interest, the average production is forty-six dollars in Wisconsin, fifty-six in Ohio, seventy-five in Illinois, eighty-three in Vermont and eighty-three in Massachusetts.

It is not assumed that these statistics are accurate and complete in all their particulars; but they are sufficiently so to give confidence in the general result. The prices named may be high, but it will appear by comparison that they are favorable to the West. Interest is computed at six per cent., which is considerably below the actual interest in Ohio and Illinois. Again, I have enumerated only the products of the land, and the products of manufactures and the mechanic arts, although Massachusetts had, in 1850, 19,598 men employed in navigation and the fisheries, while Ohio had only 4,109, Illinois 1,644, Wisconsin 561, and Vermont 159.

If we divide the entire agricultural production of each State among the men employed in that department of labor, regardless of the item of interest, we have the following result: In Wisconsin $251, in Ohio $303, in Massachusetts $326, in Illinois $386, and in Vermont $462 to each man. Let it not, however, be hastily assumed that labor upon the land is better

rewarded in Vermont than in Ohio ; there is no probability that such is the fact, and these apparently strange results must be explained in some other way.

The theory which I presented in the first part of this address, that large plains, unless subject to strong external influences, are not favorable to an active, vigorous, progressive civilization, is not a theory of my own, nor by any means a new theory ; but the statistical illustration which I have laid before you was suggested by a remark of a stranger, whom I met in a railway car, that the inhabitants of Caledonia county, Vermont, produced more than any other equal population on the globe. This seems to be an exaggerated statement, and I feel bound, in justice to my unknown collocutor, to give you the result of an analysis of the industrial power of that county, upon the plan heretofore pursued.

It had, in 1850, a population of 23,595. Adopting the prices before named for Vermont, and charging interest upon the capital employed, its net product would be seventy-three dollars for each person ; and omitting interest, it would be eighty-six dollars ; thus placing the county somewhat above the average of the State. For the purpose of comparison, I will give you the result of a similar analysis of the county of Worcester, Massachusetts.

By the census of 1850, Worcester had 130,152 inhabitants. Its agricultural and manufacturing products, allowing interest on the capital invested, and excluding raw materials, amount to $9,925,445, or seventy-six dollars for each person, against seventy-three dollars in the county of Caledonia ; and omitting the item of interest, we have eighty-six in Caledonia, against ninety-one in Worcester.

Now these facts, so favorable to New England, do not by any means lead to the conclusion that labor is better rewarded here than in the West, but that we are, as a people, more industrious. Industry with us is a matter of necessity ; with them it is a matter of convenience, or even of pleasure. It is not likely that they have a greater proportion of idlers, but that the mass are not so diligent as are the same classes with us. Men may indeed doubt whether this necessity for labor is a blessing or a curse ; most of us would make the question a per-

sonal one. For ourselves, we seek what we call ease,—relief from labor.

But is this a wise social and national view? There may be, we know there are, systems of labor so oppressive that all manly aspirations and efforts for progress are destroyed. But such is not a necessary result of our New England system. Men may, if they choose, avail themselves of many opportunities for self-improvement. Our farmers, our mechanics, our laborers in every department, have leisure. But leisure is nothing without the habit of industry first formed. It is important to the industrial classes that they have leisure; but without the habit of industry, the love of labor, leisure becomes a mere name for idleness. A lover of idleness has not the first manly quality in him. Recreation and variety in labor are necessary; but positive and systematic idleness is a degrading vice. Now ought any man to flee from New England, that he may be idle elsewhere? Admit what is probably true, that the inhabitants of the West perform less labor than the inhabitants of the East,—does it by any means follow that we are more burdened than they? The burden of labor is not determined by the amount of work performed, but by the measure of strength of body, buoyancy of spirit, and the ability we have to make the task take the place of a servant, rather than allow it to become our master.

There are but few days in New England when abstinence from labor is a physical necessity; and three hundred days' service would be no more of a burden here than two hundred and fifty would be in some parts of the West, north even of the river Ohio. I say, then, with great confidence, that a man should not leave New England to avoid the burden of labor. Idle men should be where the necessity for labor presses the hardest. But it is not to be denied that a young man of small means in money, but of fixed habits of industry, may wisely emigrate to the West in search of a home. Every man very properly desires to possess land and secure a home. This may be done even in New England; but it often requires several years of labor and economical life. A man of energy need not despair; yet he can advance to that position more readily in the West than here.

But ought farmers to emigrate who have land, homes, fixed habits of industry, and the opportunity to render their labor

year by year more and more intelligent and productive? And would it not be well for many of our young men of moderate means to accept the position of independent, though small, proprietors, in the valleys or on the hill-sides of New England?

It may well be doubted whether, for a life of labor, any part of the world offers a better return than Massachusetts. And there are few States less likely to deteriorate in character. The ocean, the hills, the mountains, the climate, the soil, all contribute to produce a hardy race of men. The presence and keen sagacity of an extensive and constantly increasing commerce, will open new and perfect old channels of trade, so that no product of our industry shall want a compensating market. We have a civilization as solid and progressive, a religion as free, a system of education as popular and perfect, a body of laborers in the mills and shops, on the land and sea, as intelligent as can be found in any State of America or Europe.

And to all the farmers of Massachusetts, it is a matter of special interest that agriculture has been ennobled. Not, indeed, by any condescension or care of individual men or the State, but by the general intelligence and spirit of progress among the farmers themselves. While farmers failed to respect their own profession, the profession itself, whatever its intrinsic merits, must have been menial; now, however, it is pursued with more of the spirit which animates the student, the painter, the poet, and the astronomer.

But let us all, whether we be of New England or the West, respect labor, not as our master, whose law makes us slaves, but as an instrument of civilization, an educator and benefactor of the whole family of man.

THE FARMER.

From an Address before the Berkshire Society.

BY HON. JULIUS ROCKWELL.

It is a fresh, crisp, morning of spring, and the youthful farmer drives afield the noble steers, which have been broken to the yoke and trained by himself. However wayward and frolicsome they were, while roaming free in the hill pasture; however much they vexed him in the yard, when he had yoked the off one, and had the near one by the bow to bring him to his place; they now seem clothed with self-respect, proud and vigorous as their young master. They march steadily forward to the field of their labor, with heads erect, and free but uniform steps, with their light load, the plough and the harrow, which, ere night fall, are to tax their utmost strength and endurance. The young farmer walks cheerfully and hopefully by their side, and recalls to mind the incidents of their short lives; how he rejoiced when he first saw the points and proportions of the one; how he traversed the county to find the other fit match for him, in form, color and mark; how he first put on their necks the little red yoke, and chained them before the old cattle; and taught them the few words of the ox dictionary, sparing not the rod the while; how in years after he drove them into the barn with their first load of hay; how they backed out the cart steadily and carefully; how to the surprise of all they took along the loaded stone boat, which the old oxen were unable to start; how they took the first premium at the fair; and how he refused the cool hundred that was offered for them on the ground.

They are now going forth to their first essay, in turning over the tough sward of the old pasture. Fear not, brave youth! patience and perseverance with your young stout heart, and

your young stout team, will work a wondrous revolution in the old pasture. The brakes and the thistles will be subdued. The hidden stones will be torn out and brought to the surface. Sevastopol will be taken. The waving corn will rustle in the yellow harvest. Your victory is sure, a victory without envy, without remorse, an unalloyed conquest of labor in the path of blessing. On that field once subdued and planted, the dews of every night—"rain from the sweet heavens," "the clear shining of the sun after rain,"—will work with you and for you. When you rise from your refreshing sleep, you will see that invisible hands have been working everywhere in aid of the abounding produce.

Not alone in the ploughing field, but in all the labors of human life, there is a constant and faithful servant to all men. But for this faithful servant, known by the name of routine, human labor would soon exhaust human strength. When he has once seen the work done, he ever after takes upon himself the most of the labor. When the lawyer has once made a complicated conveyance, he ever after makes a thousand of its class, without wearying thought by routine. So the cabinet minister writes his state papers; the clergyman his sermons; the orator his addresses; and even the poet much of his verse by routine. So the mechanic builds houses and ships by routine. And now the young ploughman, when he has marked his first furrow round his land, will go on by routine; and the off ox will take the furrow, and the near one will walk along the shoulder of the turf by routine. With the brute oxen before him, all is routine. To keep the track and press their shoulders to the yoke, to stop and haw about at the corners, to yield and pause when the plough strikes a fast stone, is all they know, and this they know by routine.

But not so with him who walks between the handles of the plough. Routine is his servant, doing the burden of this day's work, leaving the young master's thoughts free to roam far beyond the field, and as we shall see even to the ends of the earth.

Some strangers and townsmen passing on the distant high road at intervals, as the day progresses, see among other objects in the landscape, the team and the young ploughman. It is a common sight, and little think they of the serious and earnest thoughts that occupy his mind. Nevertheless, I declare to you,

and judge you, if it is not so, they are real thoughts which have occupied such a mind, in such a situation. Modified and tinged somewhat, you may think they are by the experience of life, but I hope not deprived of their freshness and truth. We hope now to find "the long, long thoughts of youth."

The father of our young friend has this morning said to him: "It is time for you finally to decide upon the direction, profession or occupation of your life. Having thus decided, you will concentrate and apply your energies in one general direction. Strength will not be wasted upon objects of no permanent consequence. In the fixed line of the future, your young vigor will all be brought to tell powerfully upon your future progress in life."

The boy had passed through the free schools of Massachusetts. By the advantages thus enjoyed, he had been placed upon that elevated common platform where every young man of the Commonwealth may stand, and where it is the fault of parent or child, or both, if he does not stand, the platform of a good common school education. This is proved by the fact, that both in our district schools and our high schools, we often find among the very best scholars, the children of those who are supported by their daily labor; and who send farthest of all to the places of the schools.

Upon this platform he stands, able to direct his course of life, in the light of a knowledge of his capacities. It is his inherent right to do so. With the exercise of this right no judicious parent or guardian will interfere, except to give facilities for a correct decision. He knows his wishes, his inclinations, his tastes, his aspirations. He should know also, his comparative ability. He may be conceited, he may be too diffident. The best remedy for both of these unfortunate diseases of the character, is found in the public schools. A recluse boy is unable to estimate himself. Instead of looking into his own soul, he looks at his own image in the glass, and he cannot measure himself with that, any more than he can measure that by himself. He must have an opportunity to measure and compare himself with many others of his own age, and precisely as he compares his stature and his bodily strength and swiftness with theirs, he measures the faculties of his mind by theirs. He learns his relative ability in his various studies. He is

enabled to see in what line of pursuit he can gratify his own feelings, and outstrip his fellows in the race.

Our young friend had thus learned that he was not a genius. He had found the several faculties of his mind, his judgment, his memory, his imagination, all moderate, but upon a fair equality with each other. He had not the glorious and melancholy gift of genius, and he had the good sense not to repine on that account; and to know that what is called genius, though sometimes the greatness of every faculty, is more usually an intellectual disease, the vigor of one faculty exhausting the resources which naturally belong to all. He had not that combination of imperious will, ardent enthusiasm, and gentle persuasiveness, which, with rare physical gifts, constitutes the eloquent orator. And he repined not at this. For he knew that the great gift of eloquence leads to mighty aspirations and crushing disappointments. He knew that he had not the quick and delicate perceptions, the power of design, the instinct of manipulation which constitutes the artist. And he repined not at this. For he knew that the more delicate the perception and the more exquisite the taste, the more rare the gratification and the more frequent and annoying the disgust. He saw, upon the whole, that he belonged to that great majority of mankind whose power and character of mind, with patient labor, enables them to succeed in any of the ordinary and useful professions and occupations of life.

He had been told frankly and plainly, as every son should be told, his pecuniary situation. He could receive some aid, if he greatly desired it, in obtaining a liberal education; if he did not, the means of that moderate aid would be his only capital upon entering active life, and that by no means certain. And he had the good sense to perceive that this, upon the whole, was the best patrimony he could possibly inherit. It seemed to his spirit a stirring and noble idea, to make his own fortune, and to rely upon himself, and he looked forward to his first unaided exertions, as to a position of self-reliance and self-respect.

And now the young man asks of himself, what shall be his course of life? The various great highways of life radiate from his position in all directions. Which one shall attract his steps and draw him onward? The most excellent profession of a teacher of divine truth, the guide of the immortal spirit to its

eternal home? He bows reverently to this great idea; and if he finds in his heart of hearts the call from Sinai and Calvary, he must obey it. He hath heard it not. He finds not in his wrestling the prevailing faith to bear him forward through the hours of want and dependence, of struggling and patient toil. Finding this, he does not aspire to this most responsible calling.

The law is a noble profession when laboriously and honorably pursued, but he has the sense to discover that no profession will be more exacting upon his time, talents and health; that the law is "a severe and most jealous mistress," tolerating no other, demanding the patient, laborious, unending examination, of all the details and complications of every business transaction of human life. The more eminent does the lawyer become in his profession, the greater, the more exhausting is the tax upon his time and strength; and the memory of his most valued efforts perishes with the occasion which called them forth.

The benign and grateful profession of the healing art? He knows that the successful practice of this profession must demand the study and memory of a vast variety of principles and rules, great discipline of judgment in applying them to the varieties of particular cases, exposure by night and by day, living in an atmosphere of pain and agony, the sense of great responsibility, the necessity of exhausting labor.

He knows that in all the professions, his compensation can only be for his own labor, that he can have profit in no way from the labor of others; and that all his earnings in the aggregate can furnish little more than the means of supporting and educating his family. Yet if he finds his heart yearning towards any one of these learned professions, he will neither rebuke nor discourage the desire; for they will lead him along high intellectual paths, will develop the noblest powers of his intellect, and give him opportunity, in high social position, to enjoy and appreciate the treasures of the leading intellects of mankind.

But his eye has already passed from these brilliant but difficult paths. It rests now upon the great broad highway of manufacturing and commercial industry. Here are the wonders of art and machinery. Here is the wide field of mechanical invention; the enticing chances of speculation, the

alluring prospects of great and sudden wealth; the view of masses of men working for him, living upon his capital; the waves of the ocean bearing to him the products of other climes, and by the profits of their exchanges, building his granaries and warehouses and palaces; placing in his power the means of liberality and abounding Christian charity. What wonder if the young imagination is borne away by the dazzling panorama of this imposing highway. But he has the good sense to look long and patiently upon it, till he sees that all along there are myriads of wrecks, broken fortunes, disappointed hopes; penury all the more severe from the recent enjoyment of affluence; temptations too powerful to resist, the wreck of fortune and the wreck of character. He sees that perhaps not ten, certainly not a score, in every hundred who choose this highway of life, are successful. At least four out of five fail upon it. Still, if the enthusiasm is in his heart; if enterprising, self-reliant, prudent, and prepared for all events, he feels that he must proceed upon it, or be ever unhappy and repining, let him trust to Providence and his own good heart.

But our young friend has decided otherwise. After all, *his* eye rests alone on the plain, unpretending, but safe and honorable highway of agriculture. By this decision he knows that he will probably forego the opportunities of high distinction and fame. He will not despise the idea of achieving a reputation which shall long survive the period of his life; because he can see clearly the effect of such hope upon a generous soul, in leading to noble and immortal actions. But the value of earthly reputation *to him*, after he has passed from earth, he does not understand, and he is content not to learn it.

But now presents itself another most interesting question. He is not yet attached and bound to any particular location. "The world is all before him where to choose." And where upon the whole will be placed his hearth-stone?

In deciding this question he will not look beyond the boundaries of his own country. Every variety of climate, soil and production, is found in his native land. With all its faults, he knows that its government is the best on the face of the earth, not only the best but the most permanent. He perceives that the foundations of its permanency are not all to be found in the virtue of the people; if so, in these degenerate days, there

might be cause of alarm; but in the fact, which every individual citizen, man, woman and child, cannot fail to see, that it is the best government in the world, and that it is his personal, individual interest, to sustain the government of the United States.

He is aware, however, that he is now in by no means the most fertile portion of his beloved country; that there are other States than Massachusetts, where, beyond doubt, the immediate results of his labor will be greater than here; where but a small outlay will purchase considerable tracts of land, from which he can realize immediate profit. In the great Valley of the father of waters, he can find his prairie home, and with much less toil, he can surround himself with abundance. The facilities of travel are now so improved and multiplied, that the time and expense occupied by his removal will be of little account, and often can he revisit the home of his youth. Do we not see now that his mind is evidently wavering? Well-balanced and true as his judgment is, can he resist these powerful inducements, these fascinating prospects of ease and affluence?

Call we now to our aid the genius of Massachusetts. With deep regret she views his wavering thought, she cannot lose so noble a spirit. At least before he decides to go he will listen to her argument. Plain but regular in her features, slightly but firmly and gracefully formed; radiant in health; not sumptuously arrayed, but with robes of richness rather than splendor; proud of her family, which she traces back two centuries to the May Flower; with modest mien, but in the confidence of conscious virtue, and patriotic motive, she thus essays the argument.

You have spoken of the rich prairies of the West; but can you fancy the dull monotonous employment of sowing and harvesting grain always upon a dull, monotonous level surface, out of which the sun rises gloomily in the morning, and into which he sinks in solitary sadness at evening, staring with his great white eye all day; his glorious light undivided, unvaried by the beautiful prisms of nature that everywhere surround you here; the mountain, the forest, the vale, the river, the cloud; violet, indigo, blue, green, yellow, orange, red, and all the variety of their combinations. Here can you realize the sublimity of the simple but wondrous words, "God said let there be light, and

there was light." Are you sure you will not find among the strangers you meet there, the trace of numerous and fatal diseases? Will you not burn with fever and shudder with ague? Is it a pleasant thing to pass through the purgatory of acclimation? Do you believe that the ease with which you acquire the means of abundant living will be favorable to industry, vigorous effort, and variety of thought and acquisition? Is it not the law of your human nature, that ease and leisure beget indolence and lead us into temptation? Is not effort, continual effort, the tenure by which you hold your health? And is not that, with your habits, education, and mode of life, your best safeguard against temptation? Is it not necessary to the development of the full man which you hope in the best years of life to become? You speak of the facilities of travel, and the means of returning frequently to revisit the scenes of your nativity. Are you sure there will be more of pleasure than melancholy and disappointment, when you find the old scenes changed, and the companions of your youth no longer here?

Besides, please to look one moment at your own native Commonwealth. Hard in soil, severe in climate, limited in extent, but still rich, oh, how rich, in the elastic energies of her people! Look to the means of education, so continually improving; to the diffusion of general intelligence, to the influences which will surround your children; to the increase of moral and religious culture; to the great fact that nowhere does the smallest village spring into existence, but first rise the church and the school-house; to the municipal division into towns of convenient area; to the entire freedom of opinion and independence and individuality of thought and action. Consider that if the great ills of humanity fall upon you or yours; blindness, insanity, deprivation of the faculties of hearing and speech, you find the best alleviatives and remedies which the best science and the most advanced civilization can afford? That to the blind, the Bible is no longer sealed; that gentle treatment and benign ministries bring back the wandering reason to its home of renovated health; that a new language opens the intellect of the deaf and dumb to instruction and communication. Consider the evidences of a liberal public spirit, which your own unaided, self-reliant Commonwealth has exhibited and is now exhibiting, in aiding individual and combined enterprise, in conquering

natural difficulties and extending the facilities of travel and trade. Consider the constant increase of population and wealth, consider the unrivalled credit of your State in the great commercial markets of the world. I venture also to suggest to you, in relation to your own chosen employment of a Berkshire farmer, your relative position and connection with your fellow citizens in the great variety of their employments. That comparatively few are, or ever will be, very rich, and almost as few very poor; that in no part of our country are competence and intelligence distributed more equally; that if your fields are less extensive and naturally less fertile than in the new States, your markets are at your own door; that your soil is not exhausted of its power, but only temporarily of some of its qualities, which, by practical investigation, with the aid of progressive science, you may supply; that your mind will ever find a great variety of interesting subjects of investigation in the processes of mechanical art and manufacturing industry around you. Consider the resources of your county of Berkshire; its mines of iron, better than mines of gold; its inexhaustible building material, the best in the whole country; sought out by the national science, and preferred as the material of the edifices by which the nation illustrates its wealth and power. Consider the manufacturing resources of your county, which have sprung almost entirely from the enterprise and industry of your people, without aid from foreign capital, and resting upon the surest foundations. Consider your advantages in pursuing the most interesting branches of agriculture, the raising and improving the domestic animals; the real life, and interest, and romance of agriculture. Do you still hesitate? Tell me where you must look for your companion in life. You might as well go from the garden of the Hesperides for apples, as to go abroad from Berkshire for the wife of your youth. And where, think you, will her associations, her delights, her happiness, be found?

And our young friend has yielded to the argument. There is enough in it to satisfy his strong good sense, and he will abide by the graves of his fathers.

Something of debt he must encounter at the beginning, but he fears it not. It will stimulate his industrious energies; it will give him the excitement of struggle, the joy of victory, and the assurance of future accumulation.

Young women of Berkshire, may I presume, with unaffected diffidence, to ask you now, how are you pleased with the reasonings and conclusions of the young hero of my address? I am not exactly authorized by him to put important questions to you. He will insist upon the luxury of doing that himself. But I am well aware, there is one of you here present, I know not which, who had better be making up her mind. You see his situation. You see the aid which he needs. You see the character of his thoughts. You see that his soul is unstained with insincerity, uncorrupted by immorality. He despises the poor vanity of trifling with the affections, or offending the purity of your woman's nature. You may have in your mind's eye the unpretending cottage which shall be built and arranged according to your taste. You may be sure that in the long winter evenings, he will be there with his well-selected library of books; that it will be his pride and happiness to care for, govern and instruct any little strangers that may make their appearance there. Luxuries will not surround you. Your plain furniture will not often be changed. There will scarcely be diamonds or pearls in your casket, but there will be roses in your hair, and the rose of health upon your cheek. And when man or woman, in the blaze of fashion, or the pride of distinction, shall cross that threshhold, they will find, and feel that they find, their equals and their peers.

But the thoughts of the young farmer have exhausted the day. His work is done. The shadows of evening are lengthened around him. The weary steers precede him, on his homeward way. Before he reaches the threshhold of his quiet home, the firmament of night is above him. "The long, long thoughts of youth" may reach from earth to Heaven.

Reads he now, in the firmament of night, the great lessons of humility and faith. Of humility: in the present population of this earth, he is but one of a thousand millions. The generations of the dead outnumber the generations of the living. And the myriads that are to come, will far exceed in number the past and the present. But what are the stars in their courses? Worlds, or the suns of other systems of worlds. Past, present, and to come, what is the number of intelligent created beings that animate the universe? And how insignificant indeed is the individual man. "What is man, that thou

art mindful of him, or the son of man, that thou regardest him?"

The lesson of faith and confidence in God: the Being who could speak into existence these innumerable worlds must regard each of them and every living soul upon them. "The hairs of your head are all numbered." The eye of that Infinite God must see every individual he has created, as really as if that individual was the only living soul. There is no relief from the dread idea, but in penitent and humble faith and perfect love, to Him and to his attributes, as to our Father in Heaven.

CHEMISTRY OF AGRICULTURE.

From an Address before the Housatonic Society.

BY GEO. E. WARING, JR.

Let us suppose that we wish to examine the composition of vegetable matter. We will take as a type of this, a cord of wood, which, if burned, entirely disappears, with the exception of a small quantity of ashes. Now in this simple combustion we have the clue to the analysis of plants, for we thus make the grand division between the two classes of matter of which plants are composed, one of which remains on the hearth as ashes, and which was derived from the soil, and another which escapes into the atmosphere from which it was originally obtained by the plant. This is apparently lost; but in nature's economy loss is unknown. To-day's decay is to-morrow's increase, and the volatile portions of the wood sent into the air by combustion, float there subject to the demands of the meanest weed. This air-born part of our crops is composed of four different kinds of matter,—*Carbon*, *Oxygen*, *Hydrogen* and *Nitrogen*,—by the various combinations of which all combustible matter, having a vegetable origin, is formed. Wood, sugar, wax, starch, gum, resin, etc., all being composed of the first three of these, combined in varied proportions, and a class of highly nutritious matter, of which the gluten of wheat is a type, being formed of the whole four. To examine minutely each of these substances, and to investigate their various changes in the plant, would be highly interesting, but is impossible in our short interview. That we may see how they behave in their many ramifications, we will follow carbon in its various changes.

If we take carbon (or charcoal), and burn it, it unites with the oxygen of the air and becomes carbonic acid, which is the

only source of the carbon of plants, and as carbon constitutes about one-half of the weight of any vegetable matter, it performs the most important part in the nutrition of plants. It is an invisible gas, pervading the atmosphere and constituting about $\frac{1}{1000}$ part of its weight. Combined with *Lime*, forming limestone, marble, or chalk, (all carbonates of lime,) and in various other combinations it enters largely into the construction of soils and rocks. The leaves of plants absorb this gas from the atmosphere and readily decompose it, returning its oxygen to the air to reperform its office of uniting with carbon, and appropriating its carbon to its own uses.

The amount of carbonic acid in the atmosphere is comparatively very small; still it is amply sufficient for the demands of plants, and it is constantly being resupplied. Were the formation of this gas to cease, the stock on hand would last our present vegetation but about seven years; but many sources of reproduction are constantly active in supplying so imperative a demand. Factory furnaces are its wholesale manufactories, (because the coal therein consumed consists mainly of carbon, which unites with the oxygen of the air, supplied by the draft). Every cottage fire is continually producing a new supply, and the blue smoke issuing from the cottage chimney—described by so many poets—possesses a new charm when we reflect that, besides denoting a cheerful fire on the hearth, it contains the material for forming food for the cottager's table, and new faggots for his fire. The wick of every burning lamp draws up the carbon of the oil to be made into carbonic acid by the flame. All matters in process of combustion, putrefaction or decay, return to the atmosphere in that operation those constituents which they derived from it. The respiration of animals—being a union of the carbon of the blood, derived from food, with the oxygen of the inhaled air—is an important source of the generation of this form of matter, and the decay of the animal's body after death continues the process.

Carbon is never permanent in any of its forms; it may exist to-day in the atmosphere, and to-morrow in the plant; and from them it may be transformed into animal muscle. That in the air is always ready to assume the vegetable form, and the immense deposits in coal beds only await the assistance of com-

bustion, to be led to the altar at which they are to be wedded to the world of growth.

The changes incident to carbon are equally applicable to any of the other æriform constituents of plants, and had we time to follow them in their varied travels, we should not fail to see the wisdom which guides those gentle forces working everywhere to advance our aims.

The ashes of plants consist of some nine or ten different mineral substances. They are indispensable to growth, and when not present in the soil in sufficient quantities, they must be supplied in some form of manure.

If a farmer wishes to make a cart, he gets together the necessary materials of wood and iron, and puts each in such a condition that it will fit its place in the structure. So it is with plant-making; we must present to their roots all of those constituents which they require. If these are not all present in the soil, or at least such of them as the soil alone can supply, cultivation is as useless as to attempt to put together a cart without nails or other fastenings. Again, if the farmer have all of the material required for making the cart, and all in the proper condition except the iron, which, instead of being in the form of nails, bolts and screws, is in crowbars, he is not prepared to complete it. So with the soil; if it contain all of the materials required in the ashes of the crop, but do not possess them all in a form available to plants, he cannot succeed in cultivation. From this it must be evident, that, except by accident, no manuring can be economical which is not founded on a knowledge of the composition of the soil, and of the crop desired. This knowledge can be obtained only by the assistance of chemical analysis. Do not suppose from this that I would recommend all farmers to become analytical chemists. A man might as well study medicine that he could cure his own diseases, theology that he could preach his own sermons, and law that he could manage his own litigation, as to study analytical chemistry because he may need a few analyses in the course of his life. All that is needed is, that farmers shall understand so much of chemistry as shall enable them to *use* an analysis with judgment. This does not require a great amount of hard study, and is attainable by all who breathe the air of America. Let your influence, as members of the body

politic, be so exerted, that the rising generation, at least, may receive the requisite instruction, and that the farmers who are to come after us, may afflict the soil less, and profit more by its acquaintance.

What plants are made of, is the first point on which the farmer is to inform himself; but before he is qualified for practical work he must understand the reason why he drains, why he ploughs, and why he hoes. If these operations are necessary, they are necessary for good and sufficient reasons, a comprehension of which is not only indispensable to the true farmer, but is easily acquired. For instance, let us see why and how draining is beneficial.

Good and efficient underdraining accomplishes, among others, the following results:—

1. It entirely overcomes drought.
2. It furnishes an increased supply of atmospheric fertilizers.
3. It warms the lower portions of the soil.
4. It hastens the decomposition of roots and other organic matter.
5. It accelerates the disintegration of the minerals in the soil.
6. It causes a more even distribution of nutritious matters among those parts of the soil which are traversed by roots.
7. It improves the mechanical texture of the soil.
8. It causes the excrementitious matter of plants to be carried out of the reach of their roots.
9. It prevents grasses from running out.
10. It enables to deepen the surface soil.

By removing excess of water:—

11. It renders soils earlier in spring.
12. It prevents the throwing out of grain in winter.
13. It allows us to work sooner after rains.
14. It keeps off the effects of cold weather longer in the fall.
15. It prevents the growth of acetic and other organic acids, which induce the growth of sorrel and similar weeds.
16. It hastens the decay of vegetable matter and the finer comminution of the earthy parts of the soil.
17. It prevents in a great measure the evaporation of water and the consequent abstraction of heat from the soil.
18. It admits fresh quantities of water from rains, etc.,

which are always more or less imbued with the fertilizing gases of the atmosphere, to be deposited among the absorbent parts of soil, and given up to the necessities of plants.

19. It prevents the formation of so hard a crust on the surface of the soil as is customary on heavy lands.

20. It in a great measure obviates the washing away of soil by heavy rains.

All of these twenty propositions are susceptible of the fullest demonstration; but for want of time we will merely examine the first one which may give us an insight into the course of reasoning to be applied to the others.

Underdraining prevents drought, because it renders the soil porous, and thereby gives more freedom to the circulation of air among its particles. There is always the same amount of water in and about the surface of the earth. In winter there is more in the soil than in summer, while in summer that which has been dried out of the soil exists in the form of a vapor in the atmosphere. Its vapory form is maintained by heat which acts as braces to keep it distended. When this vapor comes in contact with substances sufficiently colder than itself, it loses its heat, thus losing the braces which sustained its vapory condition, contracts and thus becomes liquid water.

This may be observed in many common cases.

It is well known that a cold pitcher in summer robs the vapor in the atmosphere of its heat, and causes it to be deposited on its own surface. It looks as though the pitcher were sweating; but the water all comes from the atmosphere, not, of course, through the material of the pitcher.

If one breathe on a knife-blade, it condenses in the same manner the moisture of the breath, and becomes coated with a film of water.

Stone houses are damp in summer, because the inner surfaces of the wall being cooler than the atmosphere, cause its moisture to be deposited in the manner described. By leaving a space, however, between the wall and the plaster this moisture is prevented from being troublesome.

Nearly every night, in the summer time, the cold earth receives moisture from the atmosphere, in the form of dew, by the same principle of condensation.

A cabbage, which at night is very cold, condenses water to the amount of a gill or more.

The same operation takes place in the soil. When the air is allowed to circulate among its lower and cooler particles—cooler because shaded from the sun's heat by the earth above them—they condense water as I have just described. Therefore, when, by the aid of underdrains, the soil becomes sufficiently open to admit of a circulation of air, the deposit of atmospheric moisture will keep the soil supplied with moisture at a depth easily accessible to the roots of plants.

If we wish to satisfy ourselves that this is practically correct, we have only to prepare two boxes of finely pulverized soil, one five or six inches deep, and the other fifteen or twenty inches deep, and place them both in the sun at midday in summer. The thinner soil will become completely dried, while the deeper one, though it may have been perfectly dry at first, will soon accumulate a large amount of water on its lower and more sheltered particles.

With an open condition of subsoil, then, such as may be attained by underdraining, we entirely prevent drought.

It is a source of wonder that, among so many who are ploughing over this broad land, so few pay any regard to the manner in which they plough—except to have their work as nearly as possible like the work of those who ploughed before them. Now I contend that no man has a natural right to plough who does not first reflect on the reason why he should plough at all. If we were to land on a newly-discovered island, and were to find the inhabitants busily engaged in carrying the stones from the sea-shore to a distant hill, we might consider their course unaccountable; but if they were to inform us that such had always been the custom of their people, that they had an indistinct notion that it might do good, and that they consider that a sufficient cause for their toil, we should get about as good an idea of the propriety of the affair as we should be likely to get from a genuine old "grandfather-farmer," were we to ask him why he expended the force of his team and fatigued himself to turn the earth bottom side up.

Ploughing is no child's task, to be hurried over and gladly disposed of. It should be done advisedly and with earnestness.

In order to do such work properly we must do it understandingly. Plants we know to derive a certain amount of their nutriment from the soil, absorbing it through the ends of their roots in solution in water. It is, therefore, necessary to plough so as to expose the largest possible amount of this nutriment, to allow the roots to permeate the largest possible portion of the soil, and to assist in maintaining the amount of water requisite to dissolve the nutritious matters, and carry them into roots. The supply, or rather the exposure, of the fertilizing matters in the soil, requires that it be loosened to a considerable depth and well pulverized, because we thus lay open to the action of the air, and to the attacks of roots, parts of the earth which, in less thorough culture, would be confined within compact masses. The ease with which roots can travel to seek nourishment must obviously depend on the friable condition of the soil. The presence or absence of water depends, more than might be supposed, on the manner in which the soil is ploughed; because when it exists too largely, deep ploughing will lessen its bad effects, and where it is wanting it is supplied during the seasons of drought by the atmospheric condensation explained in connection with underdraining. From this view of the case, we see that our four, five, or six-inch ploughing is not what we need. The demands of a luxuriant growth require something more thorough, and in view of the fact that the roots of corn will, when allowed by deep culture, travel to a distance of more than two and a half feet from the surface, and that, under similar circumstances, the roots of all our cultivated plants will extend more than one foot from the surface—and to advantage too—it is evident that the man who ploughs but five inches deep, when he should plough fifteen inches, does but one-third of his duty; and, if he carries out this principle in all of his operations, he is certainly not more than one-third of a good farmer—perhaps not more than a ninth. On this subject of deep ploughing I can speak with some authority, inasmuch as I have myself ploughed to a depth of eighteen inches, and have seen its manifest advantage. I believe that a deepening of three inches in all of the furrows to be turned during the next year, would add more to our national wealth than would the doubling of our cotton crop.

It is not always advisable to double, at once, the depth to which the plough is run, for the reason that the subsoil may not be at once in a condition to benefit the crop; indeed, in many soils such a course would be decidedly injurious. It is necessary, in many locations, to bring up but a thin layer of the new soil each year; this is too small in quantity to injure the fertility of the surface soil, and by exposure to the atmosphere and by the decay of roots and other organic matter, it would become in one year as good as the older earth, allowing a new quantity to be elevated, until, in course of time, the soil should be made sufficiently deep.

There is a kind of culture, recently introduced under the name of *subsoiling*, which has proved itself one of the greatest improvements ever made in any industrial branch of economy. It consists of passing through the subsoil at a depth of from one to two feet, an implement which merely loosens the mass, without bringing it to the surface. The subsoil plough has been much improved in this country, and the most recent form, which is simply a diamond-shaped foot, attached by two steel or wrought-iron standards, or by a cast-iron plate, to a common plough beam, in such manner that when used the soil is lifted *upward* and *outward*, on each side of the line of travel—may be worked by less team, and with better results than the plough of older and more generally-known construction.

By the use of this implement we increase nearly every effect of underdraining, and we greatly hasten the process of deep culture, inasmuch as the roots which penetrate the loosened subsoil, being left to decay on the removal of the crop, give it its required organic constituents, while the action of the air and water circulating among its particles, advances the changes requisite to its more perfect fertility.

Aside from this use of the subsoil plough, it has another, which promises well. Its construction allows it to be drawn through old pastures and mowing lands, at a depth of a foot or more, causing such a loosening of the lower soil as allows the tilling of the grasses to recommence, and especially if some concentrated manure be employed as a top dressing, in this manner such lands may be renovated without the expensive and troublesome recourse to a rotation of crops, which it is

often desirable to avoid. I saw a field in New Jersey, which, as its owner informed me, was completely run out, that produced two and a half tons of hay per acre at the next harvest, after having been thus treated.

Education is what we most need. Not such education as is adopted as the end of the college course, and which too often expends itself on the outer man. That is well enough in its way; but the education which the young farmer needs is that which teaches him the solid rudiments of nature's laws, and familiarizes him with the principles on whose exertion his future prosperity must depend. Farm schools, State and county agricultural colleges, and all such institutions are laudable, and cannot fail of accomplishing great results; but they are, after all, not general in their influence. The rich man's son, in them, must have an advantage over him who cannot even spend time to go from home to school. For a certain class they are excellent, for the people at large they are not what we most require. Experience has proved that, as yet, such institutions cannot support themselves, and it would be unfair to call on the masses to educate the more wealthy few, as they must do if government sustains them. Before independent academies can exist, the way to their success must be paved by the common schools—those monuments of the greatness of our country; touchstones to detect the germs of genius among our people and to arrest 'from the dark, unfathomed caves of ocean, full many a pearl of purest ray serene.'

Let the quiet influence of the common schools be exerted on those who are now receiving the impress of instruction, and in twenty years America will be peopled with a class of farmers who will cherish their own and the nation's mutual interest, instead of allowing the speculating few who now control the press and the polls, to fill their own purses from the people's treasury, while those who mainly supply it are not allowed even necessary protection.

AGRICULTURAL SOCIETIES.

An Address before the Norfolk Society.

BY REV. J. M. MERRICK.

I was somewhat surprised recently by the remark of a farmer, who sneered at agricultural societies, intimating that in his opinion they were little better than collections of quacks, boasting also that he had fair crops, although he belonged to no such fraternity. He holds but a moderate rank as a farmer in regard to the extent and thoroughness of his operations. Yet within five or six years his farm has increased in value. He has a new and flourishing orchard, improved stock and enlarged buildings, and exhibits unmistakable evidences of progress. Behold the proofs of his error! He has caught the spirit he disowns, is borne along by the stream he opposes. He is too intelligent not to profit by the impulse given to his business by men whose efforts he would ridicule. He breathes an atmosphere which they have diffused. In agricultural improvements wealthy amateurs,—call them fancy farmers if you like,—must take the lead. It is fortunate for others that they are willing to do so. By experiments conducted with more or less wisdom, and at great expense, they eventually stand upon a higher level. Through success and failure their general course is onward to superior methods of tillage, to larger crops, to better shaped animals, to more convenient tools; and, through the agency of the press and the power of sympathy, others share in these results and occupy the same higher position. It is a generous enthusiasm leading to noblest benefits. Why does an acre that once yielded forty bushels of corn now yield a hundred? Why are eight hundred bushels of roots raised upon an acre instead of three hundred? Why is the average produce of butter nearly doubled? Why do mowing fields yield two tons to the

acre instead of one? How is it that oxen of the largest size are well fatted at three years of age? or that pigs of improved forms and properties are fit for slaughter at nine or ten months, when it formerly required two years to reach that condition? Because theorists have theorized, and experimentalists have experimented, and rich men have freely spent their money, and fancy farmers have carried out their fancies, and book farmers have diligently studied their books, and agricultural chemists have investigated the qualities of soils and manures, and skilful mechanics have embodied the principles of natural philosophy in better machines and tools than our fathers dreamed of; and then all have brought their contributions into a common stock, and formed agricultural societies; and these again have distributed the accumulated gains into a thousand channels, and the practical farmer has reaped the result of the whole operation in additions to his knowledge and skill. The individual theorists and chemists and fanciers and book men may not always increase their wealth; they are not an eminently selfish race. But the community gains, and even they who ungenerously depreciate the enterprise, come in for their share of the profits.

Here then is the justification of our association. And yet I have not mentioned all the elements that enter into the result. In scarcely any other art do improvements advance so slowly as in agriculture, when not impelled by associated activities. The farmer works alone, and misses the impetus of society. Why does the Italian peasant scratch the ground with a wooden plough drawn by a donkey and a woman? or the Egyptian fellah partially disturb three inches of soil with a crooked stick? Partly because in their countries there is no common sentiment in which they and their fellow-laborers can sympathize; no associations to create that sentiment; no free thought to stimulate it; no sufficient intelligence for its basis; no means of diffusing it were it created. An enlightened public opinion does not quicken their minds to reflection or animate their labors by the hope of larger gains.

I think, however, I may be excused from pressing upon this audience the grounds that justify associations like ours. The existence of this and similar societies is vindicated by the fruits they have produced.

It is right that we should celebrate the annual ingathering of the harvest. No other interest better deserves such a commemorative service; for agriculture "is a spring that sets in motion the grand machine of business, manufacturing and commercial; nor can a sail be spread without the assistance of the plough. Every other source of independence or of plenty is perishing or casual; this is the great art, which every inquirer into nature ought to improve."

The end of agriculture is to multiply food; and abundant food multiplies men and advances civilization; for, "nations are not populous in proportion to the land they occupy, but to the food they produce." To produce the greatest amount of food at the least expense is the problem for farmers to solve. It is evident that to do this requires the combination of intelligence and labor; for agriculture is an actual producing, and a theory to account for, and increase the produce. The practical occupation precedes the theoretical system. Farmers composted manure before science explained the philosophy of the operation; and knew that wheat demanded lime before they understood the reason. Men cultivate the earth to live, ages before they learn the best methods of cultivation, before the principles that lie beneath rules are ascertained. Then comes the wise man, who, through his acquaintance with science, leads the way to better methods.

But we must not suppose that the system of agriculture pursued in this community was unwisely adopted, or has been blindly followed by successive generations, because they could not justify it on scientific principles. It is its own justification; because the system grew out of the soil and climate of New England, and out of the circumstances of our people. No theory can prove it inappropriate. Hence we deprecate radical changes. With eyes open to defects, with candor enough to acknowledge them, we would improve the system, by higher culture of the farmer himself. Our worst enemy is persistent ignorance. We cannot hope to maintain our relative position, nor to gain the highest success, against our formidable rivals of the West, unless we make a greater effort to combine labor with scientific knowledge. In practical sagacity our farmers are unrivalled; but agriculture is a complicated business, embracing a wide range of subjects connected with the soil, the atmos-

phere, manures and their application, tools and their use, and the various methods of operation. It requires a ready wit, mechanical invention, power to adapt means to ends, wise judgment and calculation. These are qualities that distinguish the genus Yankee, qualities produced and fostered by our position in a new country, by common school education and by poverty. Our young men are trained to reason and discriminate, and he who has not had the discipline which brings out these qualities stands a small chance of success.

But much more than this is demanded by our condition. School learning is rather a preparation for special training than a substitute for it. We admit this in reference to every branch of business except agriculture, in which the highest skill is thought to come as reading and writing did to Dogberry—by nature. The boy who is destined to law or medicine goes from the town school to the high school, from the high school to college, from college to the school of law or medicine, and after fifteen or twenty years' study is deemed qualified to commence the practice of his calling. But the farmer's son has no special instruction; with the imperfect education of the common school he undertakes a task that might employ the best talents amply developed by culture. The consequence is that he is apt to walk implicitly in the beaten track, to believe that his father employed and exhausted all wisdom, and that the practical sagacity acquired by experience furnishes a sufficient pledge of success. But, how can an art be properly improved without a knowledge of its theory? Practical sagacity has no insight into the mysteries of science. If the soil be exhausted by repeated croppings, it does not know the best means of restoring its fertility. It may hit upon a lucky guess, or it may lose time and money for nothing. If we would not forever blunder along in the dark, we must banish our foolish cant about book-farming, recognize our ignorance and consent to be taught by men wiser than ourselves. We must get rid of the idea of the all-sufficiency of practice and the worthlessness of theory. Let us state in a few words what we mean by practical and theoretical. "A mere practical farmer is a man who knows how to manage his ground to advantage. His natural abilities and the education of his circumstances enable him to do this. A theoretical farmer, on the other hand, is a man who understands

the principles on which agricultural operations depend." He may not have acquired dexterity in their application. He may be less successful at first than the other. That is no reason against his ultimate success. For the best farmers that I know are intelligent book-farmers, not brought up to the business, but having adopted it in mature life and conducting it on just principles, make it profitable. Such men may fail at first; and the man of routine who dreads or dislikes innovations may be diverted by their mistakes. We have enjoyed a laugh at the blunder of the farmer, who, in attempting for the first time to trim his apple-trees, placed his ladder against the limbs he sawed off, and gained knowledge through artificial bumps upon his forehead. Such blunders are fair game. Put the mere practical farmer and the man of science in a new position; let them be required to determine on the cultivation of a new article, or the use of a new manure, or the renovation of a worn-out soil, or the probable result of a new method, and there can be little doubt whose judgment would be safest. There can be little doubt which would be most likely to foresee what part of a proposed system is erroneous and what correct. The man of routine is then at sea without compass. The man of science has a guide in his knowledge and his intellectual discipline, not infallible, but of inestimable advantage. The merely practical man is apt to look at proposed changes through the spectacles of prepossessions engendered by habit,—forgetting that there is nothing so destructive as unreasoning conservatism, nothing so unnatural as an effort to counteract the laws of the world's onward movement. No man can originate improvements, however well he may perform specific tasks, unless he understands the principles on which the processes depend. The end of life will find him in the place he occupied at its beginning. The man of science has liberalized his mind by the study of first principles, and is not hampered by his experience. Practice not directed by science can do something, but it works at great disadvantage; for general principles impart the inclination as well as quicken the capacity for improvement, make its progress more rapid and prevent the adoption of error.

It is a truth recognized in every department of industry that intelligent labor is always the most successful labor. The agent

of a cotton mill, speaking of the money value of mere reading and writing, says: "the best mill in New England worked by operatives who are unable to write their names, would never yield the proprietor a profit." If knowledge is so desirable in manufacturing, in which guidance of nicely-arranged machinery is a chief employment, how essential is it to men who are perpetually in contact with natural forces, now more, now less active,—men who are required to decide questions of the rotation of crops, of the application of manures to various soils,—to make accurate and long-continued experiments in feeding and fattening cattle? Manufacturers employ the best scientific knowledge and skill in the production of a yard of calico. Is it less important that a farmer should know the cost of a gallon of milk, or a bushel of grain, or a pound of beef? Manufacturers and mechanics work on dead materials, and their labors are consequently less liable to be affected by causes beyond their control than those of the farmer. He deals with living growths, that are modified by light, heat, moisture, electricity and chemical affinities,—and hence he needs knowledge both to facilitate his operations and to multiply indefinitely the productions of the soil;—in other words, to grow the largest crop with the least expense, at the same time improving the condition of his land. The manufacturer would soon be ruined, who should persist in using machinery and employing methods in fashion fifty years ago. Why should the farmer close his eyes to the progress of the world? Surely the art of farming is not what it was in the days of the Pharaohs. Why should we think that wisdom will die with us! Is it too much to hope that the time will come when farming shall not be altogether a tentative, experimental, and therefore uncertain art, but that principles shall be established corresponding to the immense interests involved in agricultural operations?

Why are some whom I see before me recognized as eminently successful farmers, held up as examples honorable to Norfolk county? Because they know how to employ their means judiciously, and because they endeavor to bring, and so far as themselves are concerned, have brought farming into good repute as an exact science and a profitable art. The farmer must work. That happy necessity is laid upon him. Is it not better that he should work intelligently than ignorantly?—adding to his own

experience the results of ages of experimenting, the improvements that successive generations have made upon the rude attempts of the savage?

Let the farmer consider that his first duty is self-culture. If his early education was imperfect, there is so much more need of increased activity in manhood. Perhaps there is no calling in which appropriate knowedge is so sure of contributing to immediate success as agriculture. Hitherto none has suffered more from the lack of it.

And here I am reminded that most of the education our young farmers receive is merely elementary and preparatory, and that no school of agricultural science yet furnishes the necessary specific instruction. Shall this deficiency remain? Will not our wealthy men, whose munificence is proverbial, endow a school in which young men may be taught the theory and the practice of farming, in connection with a farm on which experiments shall be conducted with all the skill and discrimination which present knowledge and experience can suggest? With such a school we might hope that some certain principles would be established as guides to practice instead of our ever-varying, unreliable rules. A series of experiments upon manures and soils, on a large scale, conducted with rigid accuracy for a dozen or a score of years, might reasonably be expected to furnish a clue to practices that would insure success. Is there any other industrial pursuit that better deserves the encouragement implied in such an enterprise?

Or, if we cannot establish a public school, can we not induce some intelligent farmers to open private schools for students in agriculture? Farm schools are common in Great Britain, and are not only well attended, but at some of them crowds of applicants wait for admission. The scholars study and work, learn theory and practice, and in a few years become capable of superintending a large farm. They obtain so much information and such practical skill that they have only to ask for employment in order to obtain it. I can scarcely imagine a better method of improving our agriculture or of interesting our young men in so noble and manly a calling.

But where are the pupils? Are not our young men leaving

farming for what they esteem easier and more profitable callings? Certainly. The more reason for doing something to detain them, something to rescue farming from its ill name, and to place it on a level with the most favored pursuits? The soil of Norfolk county presents a great variety of character, but much of it is excellent. Under good management it is abundantly productive. Its average crops are larger than those of Ohio. Sufficient and well-directed tillage will bring remunerating returns. Perhaps there never was a more favorable time to invest money and labor in farming. I am persuaded that for some years to come agriculture will be the leading interest of the country—not only in its extent and the amount of its productions, for that is always the case, but in regard to profit. There is no probability that the prices of produce will ever rule as low as they did years ago. Money being more abundant will be worth less, and all that money buys worth more. He who takes the flood tide in the present state of affairs and guides his bark by knowledge, will be carried on to fortune.

In considering the profitableness of farming in this vicinity, we should remember these things; first, that no farmers live so well and spend so much on themselves and families as New England farmers,—none that make the soil contribute so much to the soul and character,—none who use such excellent implements,—none who have more convenient buildings, better furniture and houses,—none who educate their children better and contribute more to those religious and moral institutions that perpetuate their blessings,—none that identify themselves more intelligently with the government and laws of their country,—none whose real manhood is more purely developed in all the important relations of life,—none whose character inspires more confidence and respect. Even the common laborers earn three times as much as in the most prosperous countries of Europe, and have every facility which such men can have of rising into the class of landholders and employers. We would not have it otherwise. No money is better spent than that which multiplies the comforts and conveniences of home and secures the maintenance of institutions, which so largely promote the virtue and happiness of the people. Out of the farmers' homes come

the men whose character dignifies our social life, and the women whose pure hearts and cultivated intellects constitute its most attractive grace. All this outlay comes from labor expended on the land, and leaves, it must be confessed, only a small portion as profits or surplus. But may we not do better? Is not this labor employed in many, perhaps in most instances, without that amount of intelligence and skill which would render it remunerating on a much larger scale? While the comforts of the farmers surpass those of most other laborers, may they not be increased by a wiser use of the means at their disposal? As now conducted, farming demands too continuous labor and leaves too little time for literary pursuits and social intercourse, for the development of intellect and the formation of character. It is well that there is a great deal left for us to know and to do; and there is reason to believe that we have not yet arrived at the most economical methods of operation; that we have scarcely begun to apply the resources of science and the principles of mechanics to the cultivation of the earth. There is no wisdom in remaining satisfied with any state of things that we can improve, nor ought our energies to be paralyzed by the magnitude of difficulties to be overcome.

2d. That we always speak of the profits of farming comparatively—not of what is necessary to the comfortable and respectable support of a family—but we compare the pecuniary success of the farmer with that of the merchant and manufacturer. When we see the fortunes they sometimes accumulate, our sympathies are excited for the farmer, who, after a life of toil, leaves only a farm worth three or four thousand dollars. We omit many qualifying circumstances that might be regarded as compensations,—the farmer's diminished anxieties, his fewer risks, his peaceful life, the habits of economy he is obliged to form, and the greater security he enjoys from extreme vicissitudes; and more than all, the fact that farmers seldom wholly fail and come to nothing. While they are generally sure of a living, and many add to their stores, only a very few engaged in commerce acquire fortunes, and in one of the largest and most important branches of manufactures in New England, scarcely a man *has failed* to fail. I have no expectation that the majority of young men will be influenced by this considera-

tion, or that they will cease to be excited by the magnificent results that occasionally attend mercantile adventures; but I am none the less convinced that, taking all things together, and in the long run, the intelligent cultivation of the soil offers a most reasonable prospect of success, a sure path to competence if not to wealth.

3d. For this additional reason, the system of farming among us is in a state of transition from the established routine of practice to a better order, founded upon the diffusion of science and upon the greater employment of machinery. The sturdiest conservative must admit the increase of knowledge and its increased application to agriculture. It diffuses itself slowly yet surely from the studious mind to the laboring multitude, suggesting improvements in every department of the business. There is an active spirit of research, of inquiry, of experiment. Science, and especially the science of chemistry, is successfully applied to the analysis of soils, and the composition of manures. Prejudices are conquered, doubts solved, light let in upon darkness, and the effect is seen in more thorough culture and in annually increasing crops. The process advances, and its blessings reach even those who set themselves defiantly against it.

Machinery is destined to work an immense change in farming. The ingenuity of our mechanics is unbounded. Already they have discovered valuable applications of great principles to the facilitation of labor; and there is every reason to believe that the machines now in use will be simplified and furnished at smaller cost, and employed with less expenditure of power, and that others will be invented that shall shorten many processes and lighten the burden and enlarge the products of toil.

On the prairies of the West mowing and reaping machines are now indispensable, and owing to the high price of labor will be brought into use here. This will compel a better cultivation of the soil, its more thorough ploughing and pulverization and rolling, which are great benefits in themselves, while they render the use of machines easier. Add to these, corn-droppers and shellers, seed-sowers, subsoil ploughs, horse-hoes, improved harrows and rakes, threshers and winnowers, and perhaps one of these days steam threshers and ploughs, and we

have facilities for saving labor that will more than balance the high price of hand-labor by enabling the farmer to dispense with a large portion of it. These and similar things are producing a revolution in farming, that will render it more attractive and more productive. By their means we shall be able to cultivate more land with less labor and expense than at present, or to cultivate the same amount of land better, and with a corresponding augmentation of productions. This conviction has taken strong hold of the minds of the best farmers of Europe, who receive with enthusiasm and employ to great advantage the inventions of our countrymen in this department. We ought not to be behind them in enterprise.

We may add to these the reclaiming of meadows, deeper ploughing and drainage, less dependence on poor pastures and more green soiling, more careful selection of farm stock, more roots for fodder, good barn cellars, the more general use of guano, lime, bones, salt and other concentrated manures, solid and liquid, greater economy in the application of manures, more frequent taking up of lays and less topdressing,—in short, a constant reference to the principles on which a rational tillage of the soil ought to be founded. By these and similar means we may hope to inaugurate a new era in agriculture, which shall combine intellectual progress and pecuniary profit.

4th. Another thought should have some weight with the young farmers of Norfolk county, before they abandon farming as unprofitable. They live near a great centre of population demanding to be fed; and if the old routine of grass and corn proves unprofitable, may they not inquire whether vegetables and fruits may not be substituted in their place? These are so perishable that they cannot be brought from a great distance, and therefore competition with more fertile regions is avoided. It seems nearly impossible so to supply the market as materially to reduce the price of these things. Ten or a dozen acres cultivated garden-fashion may be made to support a family better than many large farms do now. The orchard too, is a source of profit, when managed with judgment. The nearer farmers approach to the practices of the gardeners, the more likely will they be to succeed, whether they supply the daily markets or not.

I might extend this thought further, and say that the farmers of Norfolk county have not only the advantage of Boston market, but also of that near and profitable market which is furnished by the mechanics and the manufacturing population of our villages. The artisan is placed side by side with the farmer, the consumer with the producer, an arrangement the most advantageous, so far as the distribution of agricultural productions is concerned, and the general prosperity and morality of the people. I do not say that this arrangement leads to the maximum of production; for that much land and a free use of capital are necessary, and it tends to the depopulation of a country and the separation of its various interests. Happily for us our farms are generally small, and their productions, instead of one or two great staples, consist of hay, grain, vegetables, pork, butter, milk, poultry, eggs, &c. These must be marketed often and with little expense. In forming our ideas of farming as a profession, we are apt to overlook these, and yet in the aggregate they amount to more than all the cotton, rice and sugar raised in the United States. Our farming interests are closely connected with those of mechanism and manufacturing. No civilization approaches towards perfection that does not present this union, and the more thorough the union, the more does each pursuit contribute to the prosperity of the others.

Every mechanic's shop, every steam engine at work, every stream occupied by a mill, yields something to the farmer's profit by furnishing a ready market for his produce, while the perception of mutual dependence and support benefits his moral nature. When one interest predominates the body suffers. There are in Massachusetts towns in which there are no mechanics, no mills, scarcely any trades. Farming is the sole business. The young men remove to the West or to cities. The population diminishes. The farms become fewer in number and of larger size. The property is concentrated in few hands. The social and moral condition of the town, and usually its interest in education, deteriorate. But the gross amount of agricultural productions is increased, and the profits still more increased in consequence of the easier control of capital. I consider this unfortunate. So far as it extends, it

approaches a social condition in which the community is divided into classes with opposing interests. It tends to lessen the number of small farmers living on their own property, and to multiply laborers who cannot hope to become land-owners. Were it not for the unbounded territories of the West, such a state of things might be perpetuated, and the time would come when multitudes of dependent men would beg for the pivilege of toil,—the poor privilege of keeping body and soul together. Whatever tends permanently to lower the wages of labor is an injury to the State. Whatever is lost to the wages of the laborer is added to the wealth of the land-owner, without a corresponding compensation for the unequal distribution of profits, in an increase of social benefits.

There is hardly another circumstance that adds so much to the value of land and labor as a near and easily accessible market, where the productions of the soil may be exchanged for other necessaries of life. This market the farmers of Norfolk county have in the capital, and in numerous manufacturing and mechanics' villages. They have intelligence and enterprise enough to avail themselves of its advantages. There is scarcely a limit to the demand for their productions, while facilites for reaching the consumer are unequalled. Let them abandon the idea of fortune-making in the West, and adhere to the incomparable blessings of education, religion and social refinement at home. Let them remember that for generations agriculture in this country has supported tens of thousands of excellent citizens,—supported them, I venture to say, in as high a state of civilization as the tillers of the land ever reached on this earth. With every year the inducements to cultivate the soil are multiplied,—high prices, ready markets, increasing knowledge, improved machinery, and the examples of successful individuals.

It may be said that the soil is hard and the struggle unceasing. Does not history teach us that agricultural prosperity is usually proportioned to the difficulties to be overcome? Is it not so in every department of human activity? Compelled to honorable toil we gain things that more than compensate for fertile fields and milder skies,—energy, enterprise, aptitude for business, a *habit* of industry, and all the manly virtues that

flourish in the farmer's home. We may have failed in Norfolk county to raise the greatest crops of corn and grass, though I think rarely; but we have never failed to raise a crop of fair women who adorn and bless our homes, and men who cherish "constitutional freedom, and that passion for liberty, which are the great and earliest glories of our English race. Poor as our soil may be compared with others, ungenial as our climate may be, it is precisely in consequence of these, that, under Providence, our farms are tilled by free men;" that the products of labor are so widely distributed, maintaining so many families in the enjoyment of almost unequalled blessings.

To the young men of our county, who have been educated by institutions that teach them to place the highest value upon character, we commend agriculture for its moral tendencies as the great conservative element of society. Amid the agitations and excitements that occasionally sweep over the country the farmers stick to the soil and increase its value by their labor, giving it, in fact, by that labor, all the value it has. Their calm pursuits moderate popular phrenzies, and fit them to fulfil the highest duties to society. They may be slow, cautious, discriminating, averse to sudden movements, perhaps too conservative, too timid in adopting ideas and plans, the importance of which others clearly discern; but they are the men to be relied on for substantial efforts, for the performance of their social obligations. You know where to find them. They are necessarily tied to their homes, which are for them realities around which their affections cluster. Others may lead the movements of the age as light skirmishers; but the heavy masses that are to secure the ultimate victory will be found among the cultivators of the soil. Men who pay taxes, maintain schools and churches and impress their character permanently upon the country, can never be unfaithful to the great interests of social life. In their retired homes, with leisure for the agricultural newspaper or the scientific treatise, surrounded by the fruits of honest labor amid the grand or lovely scenes of nature, the ever-freshly uttered words of God, they may enjoy as large a share of earthly happiness as falls to the lot of mortals.

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